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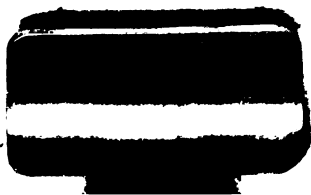
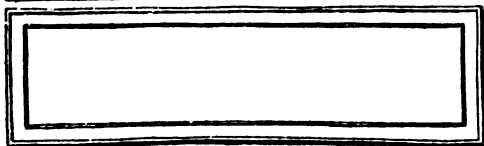
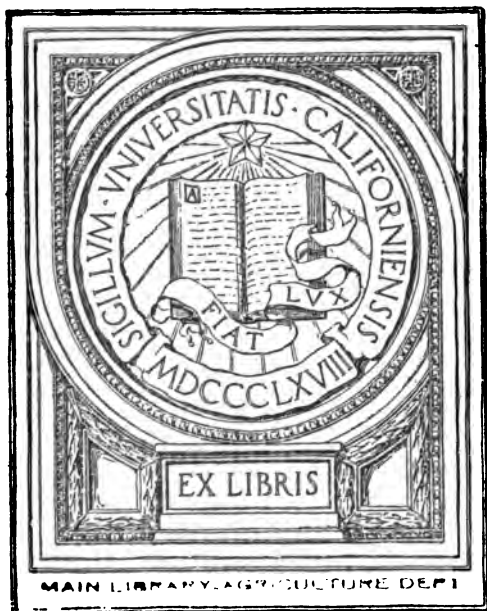
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AMERICAN
FRUIT GARDEN COMPANION.



Chas Hovey Esq
with the Respects
of the
Author

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THE **ART** OF
AMERICAN **FRUIT**

FRUIT GARDEN COMPANION,

BEING

A PRACTICAL TREATISE

ON THE

PROPAGATION AND CULTURE OF FRUIT,

ADAPTED TO THE

NORTHERN AND MIDDLE STATES.

By **E. SAYERS**, GARDENER,
AUTHOR OF THE AMERICAN FLOWER GARDEN COMPANION, ETC.

BOSTON:
WEEKS, JORDAN AND COMPANY,
1839.

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TO
GEORGE C. THORBURN, Esq.
OF NEW YORK,
THE
PRACTICAL AND SCIENTIFIC HORTICULTURIST,
THIS LITTLE BOOK
IS
RESPECTFULLY DEDICATED
BY
HIS OBLIGED FRIEND,
THE AUTHOR.

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INTRODUCTION.

IN presenting the "Fruit Garden Companion" to the public, the writer begs leave to state, that the principal object and design of the work has been to condense in the most convenient form, as a manual, practical remarks on the culture and management of the different kinds of fruit adapted to the Middle and Northern States, for the fruit garden and orchard.

At the commencement of the work several pages have been appropriated to the phytology of plants, in order to familiarize the young cultivator with some of the leading characteristics of trees, as, the bud, flower, leaf, root, &c. In the description of this part of the culture of fruit trees, my object has been to use such terms as are the most simple and generally understood ; and hence many classical terms have been rendered into English, with a view to make horticulture familiar and easy, so far as or-

dinary and unobscure diction will favor that end. In most cases, where the classical name has seemed to be necessary, it has been inserted in italics. The professional botanist and naturalist will, I hope, make every allowance for a work that has no other aim than to render the culture of fruit easily accessible to the inquiring observer.

In the Nursery department, which naturally follows the phytology of trees, I have given practical directions on the propagation of fruit trees from seed, and the many methods of grafting, budding, and bringing a fruit tree into the proper size and state for the final planting into the fruit garden and orchard. In this part of the treatise, it will be seen that I have rigidly adhered to a system of raising fruit trees from seed, in preference to that too often adopted of growing young trees from suckers, which are ever the offspring of a multitude of young plants that rob the parent and impoverish the soil.

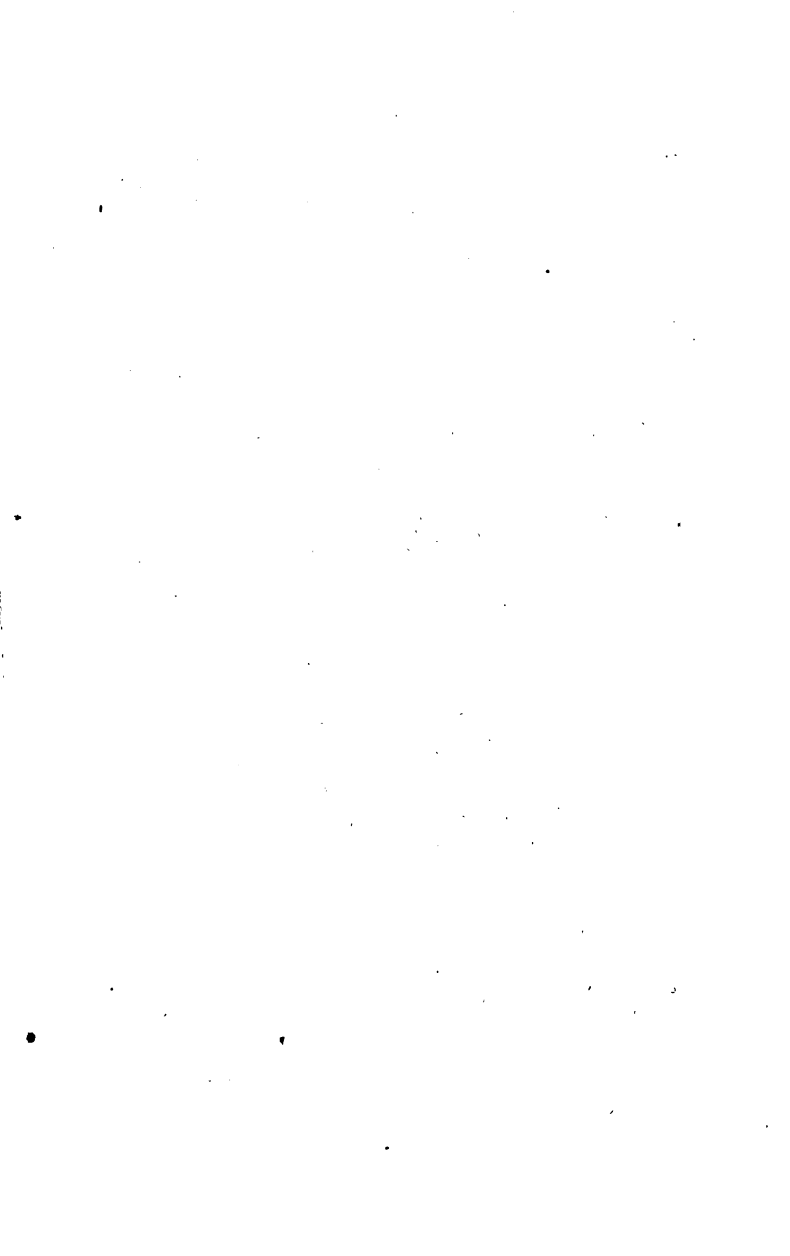
In the different modes of culture of fruit, I have described those methods, which appeared the most simple and readily to be accomplished, and such as will most surely lead to a satisfactory result. To pretend to elucidate every nice point belonging to the

culture of fruit, in the present enlightened age of horticulture, would be undertaking a task which I must acknowledge I am utterly incapable to accomplish. But, so far as this manual has any pretensions to the culture of fruit, I have given the results of *practice*, in a manner and with a view to assist the inexperienced cultivator : and any errors that might have occurred in penning the articles, or any theory that may appear improper to the scientific horticulturist or pomologist, I shall at all times be happy to correct.

It would be superfluous for me in this place to enumerate the reasons, why and wherefore, for inserting the different articles in this little manual. They have all been inserted for one end, namely, to be useful to the young beginner in the culture of fruit. The different subjects treated on can be more readily comprehended by reference to the table of contents, than by a long explanation in an introduction. With these remarks I send forth my little manual to the public, with a hope, that it may in a measure prove to be, as its author intended, of some utility to the young cultivator of fruit.

EDWARD SAYERS.

MARCH, 1839.



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AMERICAN

FRUIT GARDEN COMPANION.

GENERAL OBSERVATIONS ON THE CULTURE AND MANAGEMENT OF FRUIT.

THERE are few branches of Horticulture, that are more deserving of a careful observation, than the culture of choice fruit; yet there is scarce any subject connected with this science, that is less understood than this, except by a few individuals that have paid much attention, and made minute investigation into the natural properties of fruit trees—who have in many instances not only realized every expectation, but in many ways received a compensation for their labors of the most satisfactory return.

Choice fruit of almost any kind meets a pretty general demand in most of the markets in the Northern States; nor has there been any lack in planting in most parts to meet the demand. However, a deficiency is apparent, which must be considered partly owing to mismanagement; and unless better modes are applied and strictly attended to, the deficiency will in a few years be severely felt in many parts of the Union. In the first place, it will be seen that there is a mismanagement in the select-

ing of the ground and location to be planted, which by many persons is considered a subject not worth consideration ; when on the contrary on it depends the principal chance of success,—for if the soil and location are not well chosen the best efforts of culture will, in a measure be defeated; and the produce unsatisfactory ; hence in many an idea prevails, that it is impossible to bring the desired kinds of fruit into a healthy growth and bearing ; when the deficiency is wholly in placing it in an inappropriate situation. The most common error of this kind, may be seen in the apple-orchard ; and, although the fact is apparent to any intelligent observer, no exertion is taken to counteract it by many persons who are engaged in planting orchards at the present time. The apple tree flourishes well in almost all parts of the Northern States, when planted in a sheltered situation, on the base of small hills and alluvials in well sheltered valleys, &c.—especially if the soil is of a rich mellow loamy nature, which is often to be found in such locations. The contrary location is that of unsheltered hills of a poor, gravelly nature, where the chilly northern winds have their effect on the trees. It seldom happens that trees so located either flourish or bear good crops of fruit ; the trees, both body and branches, are, in such situations blown all on one side, the limbs stunted and the bark covered with *moss*, the true indication of poverty and stagnation. The fruit of the *former* is mostly of a fine quality, good flavor and produce : the *latter* small, wormy, and of a meagre flavor and produce. The *pear* thrives well on stiff clayey soils, in a well sheltered situation. The *plum* is more local in its nature, than either the apple or

pear, for it seldom thrives well and fruits in perfection but in a low, moist situation, where the soil is naturally *rich* or made so by adding plenty of manure to it; in such places the plum does well in most parts of the Union. The cherry, on the contrary, will accommodate itself to almost any location, soil, or aspect in any part of the northern states, providing it is not winter killed which is sometimes the case with the tender kinds, but side hills and dry sandy bottoms are best adapted to the health and produce of the cherry.

Every fruit indeed, will be found to have a natural tendency to a peculiar soil and location, which I shall endeavor to describe under the different heads of culture, as I proceed.

A mismanagement is also often very apparent in planting trees, which in many cases is badly done, and is the result of retarding their growth when young in a manner that they never fully expand into a full growth and vigor; and hence the cause of so many stunted trees, that are to be seen in almost every place. In many cases, fruit trees are much crippled in their early stage of growth, by allowing them to bear a quantity of fruit the first year after planting, by which their vigor and vital principle is in a certain degree exhausted, and the tree never afterwards assumes that habit it would otherwise have attained. To the above, may be added the general neglect of pruning and thinning the branches of trees, and regulating them in such a manner that the sap has a regular flow to all and every part of them, their leaves, flowers and fruit.

Under the head of culture, one very essential consideration should always be borne in mind by the

cultivator, namely, *that of planting in a proper manner*, which is often little attended to or thought of : trees are often planted in a careless manner, and are merely left to chance in culture, which is the very thing that should meet the most strict attention in young trees. There are indeed but few things that require a more strict attention than a young plantation of fruit trees, which should be well worked among and manured almost every year. The reverse is often seen—young thrifty trees being planted in an uncultivated piece of ground, and perhaps neither cultivated nor manured for some years after the first introduction, when age in most cases rather decreases than increases their size and vigor. *It is in the infant state that trees and plants of all kinds and denominations require the best culture and nutriment, to expand their organs, and form a good habit ; indeed, the first formation is the very essence of every other expectation that is to be realized in culture, either good or bad ; therefore, the result will be in accordance to the first management.*

In closing this article, it will be proper to state, that it is intended as a text only, to what is to follow ; the principal object of the treatise being to condense each separate part, under its individual head, in order to guard against repetition as much as possible :—therefore, the reader must not suspect the use of a quantity of paper, or number of words, to be the object of the author ; but a short and plain manner of coming at once at the subjects hereafter to be treated upon.

PART FIRST.

PROCESSES OF VEGETATION.

CHAPTER I.

REMARKS ON THE FOOD, STIMULANTS, ETC. OF PLANTS.

•

ART. 1.—*On Earth and its use to Plants.*

EARTH or soil is the base on which most vegetable substances must live and receive their nutriment. It is true, tulips, hyacinths, and other succulent bulbs, have sometimes been found and are frequently brought into a state of vegetation and flowering in water alone, or at least with a very small portion of nutriment ; but such plants do not during their process of growth obtain their proper qualities, nor will they vegetate freely the succeeding year if planted in their natural soil.

“ Nearly all vegetables,” says the learned Chaptal “ derive their support from the earth. There are however some, the seeds of which being deposited upon trees by birds or by the winds, germinate and grow, appearing to be in the situation designed for them by nature ; such are the mistletoe, the mosses, &c. There are others that float upon the water or fasten themselves upon dry rocks, upon

slates, or tiles ; of the last kinds are the fleshy plants. As the earth furnishes the greatest number of plants, and all those which are of the most importance to man, its influence upon vegetation is of the greatest consequence, and at the same time one of the most difficult of which we can treat.

“Plants are not, like animals, endowed with powers of locomotion ; but are always fixed to a limited portion of the soil. They depend on the small space which they occupy for the supply of their wants ; they can place under contribution only those portions of the surrounding air, earth, and water that come in contact with them ; it is necessary, then, that they should find immediately around them the nutritive principles requisite for their growth, and for the exercise of their functions ; it is necessary that they should be able to extend their roots, in order to draw from the soil its nourishing juices ; and to fasten themselves in the earth, so as to be secure from being dried by heat or uprooted by winds.”

ART. 2.—*On the Food of Plants.*

The food of trees and plants is found to be, in most cases, either animal or vegetable substance in a decaying state ; and is absorbed by their roots principally in *aqueous solution* or water ; plants also imbibe some nutriment from the *atmospheric air* by the leaves, which imbibe moisture through their pores ; they also imbibe nutriment from the atmosphere of decomposed animal and vegetable matter which is carried to them by high winds, &c., from high-ways and other places adjacent to them.

In speaking of food of plants of the most essential and proper nature, I have never found any that answers a better purpose than well rotted manure from the stable yard, as horse, cow, or hog manure placed in a heap for fermentation with a quantity of loam, or peat incorporated therewith ; this compost should be well rotted and mixed before it is carried on the land. I am well aware that there are many kinds of stimulating manures recommended, as bone dust, horn, shavings, and other powerful stimulants, besides many kinds from minerals, as lime, plasters, and the like ; these I cannot pretend to say are not in many cases very quick and beneficial in their operation, but I am of opinion that the first recommended kinds, although more steady and moderate in their operation, are much the best. The best food for trees not in use that I am acquainted with is old woollen rags or cloth cut into small pieces and dug or ploughed into the soil about the roots of trees ; young trees are particularly benefited by this manure, as it is one of the best substances I am acquainted with to cause young trees to throw out fibres, and support them by emitting to them a gradual moisture of an oily nature : this also serves to retain moisture in dry weather and absorb it in moist. Many kinds of *fish* are very active and forcible manures for young trees, but they are not to be recommended, as they rather force than invigorate the nature of the tree. When exhausted, trees generally linger if not well supplied in after years from such active manures ; blood, night-soil and many other things may be recommended when incorporated with loam as manures, but they require to be used with caution in order that the vege-

tative principle of the tree may not be forced too much. Moderation in the food of trees and the vegetable kingdom is quite as much required as in the animal, and that kind will be found to be the best that acts the most uniform and regular for a length of time.

ART. 3.—*On Moisture.*

In speaking of moisture I shall confine the subject principally to that which is imbibed by the root in the natural location when the tree is growing. This is essentially requisite to be known by the planter, because different natural locations have different effects in the growth and health of fruit trees. The Strawberry and Raspberry require a moist location as do the Plum and Quince, whilst the Cherry and Apple do better in a moderate dry soil; now it is not pretended that these fruits will not grow on the opposite locations; for the Raspberry and Strawberry will grow on dry situations but their produce will generally be discouraging.

When moisture is too abundantly applied to trees and plants in hot weather, it often happens that their leaves are scalded when the sun acts freely on them, this is owing to their leaves being overcharged with water; so that perspiration cannot take place speedy enough to throw off the superabundant moisture before the rays of the sun scald the leaf.

Every care should be taken by the planter to let off a superabundance of surface water from the ground that collects either from heavy rains or melting snow. When allowed to remain and saturate the soil, the roots of trees are materially injured by

it; particularly new planted trees, for the wounds of trees being very tenacious of wet, generally decay where wounds are made, and hence *rot* or mortification from a small part is often extended to a magnitude that is a serious injury to the tree. Moisture should in all cases be considered useful in a certain degree, but when applied too bountifully is injurious.

ART. 4.—*On Drought.*

The principal injury sustained from drought by the planter, is occasioned by its long continuance early in the spring of some years. In consequence of this early drought, at the period when the young fruit is swelling and requires to be nourished and invigorated, the fruit fails and drops off. This more generally happens on dry soils than moist, and hence in dry seasons we find the plum and other fruits fail in consequence of too much dry weather during the growth of the fruit.

The only methods to assist fruit trees against this is to water, or melch over their roots with long manure or other substance that retains the moisture; this method cannot be followed to any extent with grown trees, but in young planted trees the melching or covering with anything to keep the roots moist is often of very essential service.

The Strawberry is almost the only fruit I am acquainted with that will pay for watering, and that under circumstances where water can be conveniently obtained, as from a pump being conducted through pipes or other conveyance so as to flood the beds every day or two when in bloom and setting the fruit. This will be of essential service.

ART. 5.—*On Heat.*

It is very evident that trees require a certain heat to grow and mature their fruit and wood in a proper state. In cold moist summers, especially the latter part, or the fall, fruit trees many times do not form and mature their buds and wood in a proper state. This often happens in Raspberries, the canes or wood of which are kept growing in cold moist seasons, so that they do not ripen, and the consequence is that they do not fruit well the following season. The best method to counteract or remedy this is to cut out most of the wood, leaving those canes only that are to fruit next year; by this means the wood is more exposed to the sun and air, which acts on and ripens it better than when shaded by all the old wood and that made the present year. In cold seasons the ripening of fruit may be much assisted by thinning out part of the superfluous wood and part of the leaves, so that it is exposed to sun and air; in this operation moderation is required, for in many cases when over done, as in thinning off too many leaves from grapes and other fruit, it is scalded by the sudden influence of the sun's powerful rays which have before been excluded.

Sun heat should in every case be considered as the maturer of wood and the fruit of trees. Therefore the different parts of the tree should always be moderately exposed to it, but care must always be taken in pruning, and thinning that the change is not too sudden, which is always injurious.

As regards the ripening of different kinds of fruit,

there is some difference in the influence of the sun, for we find that some kinds, as the Gooseberry, ripen best in the shade, and some in the sun ; this must be learned by the practitioner by observation of the ripening of different kinds in different locations of of heat, cold, drought, and moisture.

CHAPTER II.

REMARKS ON THE DIFFERENT PARTS OF A TREE.

ART. 1.—*On the Seed.*

THE seed contains all the rudiments of a young plant in *embryo*, and commences a state of vegetation so soon as a proper *heat*, *air*, and *moisture* is present, when, imbedded into a congenial soil, if its vegetative properties have not been damaged or lost by any accidental causes which might have happened. It is seldom seen that seed loses its vegetative properties by cold, when a free circulation of air is present, and it is not saturated by moisture. In order to prove this fact I have exposed many kinds of seed to extreme cold, but I have never found them to be injured if in a dry state ; but on the contrary, when seed is kept in a warm moist situation its vegetative principle is often put into action before its proper season, and the consequence is, the seed is materially injured, if not totally destroyed. Many kinds of seeds covered with a hard shell, as stone fruit, keep better and vegetate more freely in the spring if they are mixed with earth

when taken from the fruit and kept through the winter in a tub or other vessel until the sowing in the spring. This method may be adopted with the plum, cherry, and all kinds of hard shelled seeds. The kernels or seeds of apples, pears, and most pomiferous fruits may be taken from the *pulp* when ripe and kept in sand through the winter. In this state they will keep regularly moist and their vegetative principle in a more vigorous state, and from decaying, although moisture is injurious to seed in a dormant state; it may be applied to such seed as is covered with a hard shell during its dormant state, as the peach stone, cherry, and the like. In this case moisture applied in a moderate manner serves to assist in the gradual decay of the coat or covering, which is the shell; this is designed by nature to protect the kernel or seed during winter from wet and other detrimental causes injuring it before vegetation can take place; but at the same time it is impossible that the kernel or seed can vegetate until the covering is decayed, which must be done by the action of heat and moisture to decompose the shell, previous to the seed's vegetating; therefore the utility of preparing seeds of this kind previous to planting is at once apparent.

All kinds of seeds require a proper heat and moisture to cause them to vegetate freely; hence tropical seeds, as the cucumber, require 60° of heat to cause them to vegetate, whilst those of the temperate zone grow freely in the moderate heat of 40° or 45°, this should be borne in mind by the cultivator, in order that seeds may be sown at the season when vegetation will take place to the best advantage.

ART. 2.—*On the Root.*

The roots of trees are the principal channels by which the food is extracted from the soil and conveyed to every part of the tree. And hence it is very evident that they should be placed in a soil that contains nutriment, and of a consistence adapted to their nature which will be found to be different in different kinds. The fibrous roots being the mouths or those parts which imbibe the nutriment of the tree, it should therefore be the object of the cultivator to use every means in cultivating the soil about the base of young trees, in a manner to encourage the growth of roots as much as possible. It is a *fact* I believe to be but little known, that in many cases roots of trees are much injured in cultivating around them by deep ploughings, and working with a spade; in this working about trees the roots are often cut off, or bruised in a manner very injurious to them. In this way the bark is often bruised so that the roots are wounded for several years, and in a state of incipient decay, and hence the tree makes a tardy and weakly growth. Trees should be worked about the roots with a pronged fork or instrument, that will not cut or injure them. It will be needless here to say that the soil about trees should be well manured and worked, in order that they may knit and grow freely into the soil.

In all cases young trees should be grown in such a soil and situation, that the roots may extend themselves freely when young; and here I must beg leave a little to deviate from the old proverbial phrase, “as the branches are inclined so the *tree* is

formed." I think it is more proper to say, to "as the roots are encouraged or inclined, so the tree is formed." In planting young trees care should be taken that the soil put about their roots is of a free mellow nature that adheres to the fibres freely ; but not in a clammy state like paste or mortar ; which instead of giving a base for them to strike into and retain the food and nutriment, chills them into a torpid state, saturates the soil, and finally rots the tender fibres, then the larger part, and so on until the entire roots decay, and then the tree. When trees are thus going into decay their leaves turn yellow, are feeble, the wood slender and soft and affected by almost every change of weather when in a growing state.

I must here caution the young planter against the very improper manner of planting trees with any parts of their roots injured, which rarely heal, but often, mortify, mould and rot others to the great detriment of the tree.

It is better at once to cut off any decayed part cleanly, than to venture to put it into a soil and situation where the eye has not the power to see the injury the tree is sustaining from a decayed part, as that of a branch.

ART. 3.—*On the Leaf.*

The leaves of plants being the principal organs of respiration, and contributing to their growth by their power of absorption, are of the greatest importance in this operation. The surrounding air whether internal or external being absorbed by their agency, requires to be of a pure and wholesome na-

ture, in order to keep them in a healthy, vigorous state.

When too much heat and moisture are applied to a tree growing in a confined or shaded situation they are imbibed by the leaf, and the consequence is that the plant is elongated without its proper qualities ; the leaves assume a feeble appearance, and are often totally destroyed when the sun and air act on them ; hence when young plants (as in seedling beds in the nursery) are so confined that they cannot expand their leaves so as to receive a due proportion of sun and air, it is not to be expected that they will obtain a sufficient strength and vigor.

It is proper in seedling beds to thin out the young plants so soon as the leaves appear on the plant, to such a distance apart, that they may have free access to the sun, air, and other stimulants. This fact is apparent to any careful observer who will notice a quantity of seedling trees growing in their natural state in woods or other places ; in this situation when the young plants are grown too thickly together, many naturally die for the want of air, and the remainder in the succeeding year make a healthy growth because they can then obtain a due share of air and other stimulants. Now as the soil at the roots of these trees is in most cases quite sufficient to feed them, it is evident that suffocation or want of air is the cause of the plants dying ; therefore it is plain that the leaves are of great importance to trees and plants.

The leaves of trees, we are informed by botanists, are analogous to the lungs of animals ; therefore

they are of the greatest importance in their operation, besides being designed by nature as a protecting screen to the young shoots and fruit ; being of such importance then, it is highly requisite that every attention should be paid to the keeping of leaves clean from any insects, disease or other detrimental causes that shall either weaken or retard their growth, particularly in their infant state, for at that stage of their growth they are naturally thin and tender, and hence whatever attacks them proves more injurious than when they are in a more mature state. Whilst on the subject of the leaf, it will be proper here to say a few words on the too severe and injudicious manner of taking many leaves from grape vines and trees when in a state of vegetation ; this when done to an extreme, is certainly an act of violence inflicted on nature, by the plants being deprived of their most useful organs when they are the most needed to support vegetation ; besides, the young branches and fruit are hastily exposed to the influence of the sun in a manner that is very injurious to them.

The cultivator should always consider leaves of trees as the most essential organs, and requiring every attention to be kept in good order for the well being of the tree.

ART. 4.—*On the Bud.*

The buds of trees are termed by botanists the *Hybernacula* or winter quarters of plants ; they are formed in the summer, and properly fed and nourished preparatory to the winter by the descent of sap in the fall.

Buds of trees are of three kinds, namely, those

which contain the blossom in *embryo*, as in the apple and cherry ; and those in the same kinds of fruit trees, denominated the wood bud, which are intended to give leaves and branches the ensuing spring ; and thirdly, those kinds which contain the young wood and flowers under the same cover, as in the grape, and most kinds of running vines. These buds are all carefully protected by nature with a hard scaly cover to shield them from the winter's severity ; however, in many cases the blossom buds, as in the peach, are winter killed in the Northern States, but it rarely happens that the wood bud is affected unless the whole branch is injured.

The maturation of buds, is of great importance, because the succeeding crop of fruit in the ensuing season depends much on the fruit buds being formed sound and plump, particularly in the grape and peach, for if the buds are not well formed in the fall, it is an almost certain cause of failure of a crop of fruit in the next spring.

There can be no general rule, so far as I know, laid down for the maturing and forming of fruit buds. The best thing to be done is to be careful and keep up as regular a flow of sap as possible during the growth of the young wood, for it must be recollected that the feeding of the bud is essentially necessary at this time, in order that it have its proper quality, which can only be obtained from the soil and atmosphere ; hence we find that many young trees and those which are in a feeble state, in dry seasons seldom form their fruit buds so as to blossom freely, or strong enough to bear fruit the ensuing season. Trees in a growing state should also be kept clean of insects, which enfeeble the bud,

for every thing should be done to form it in a vigorous state.

Whilst I am on the subject of buds it will be well to say a few words on inoculating trees, by inserting those from one to another under the bark or outer covering. To succeed in this operation, a nicety is required in the choice of the part to be inoculated and the selection and management of the *bud* ; the time that this operation can be done to the best purpose is when the young wood is so ripened, that the bud is plump, and the sap of the stock is flowing briskly ; for, unless a speedy and free union is effected between the bark of the bud and the alburnum of the stock, a failure must certainly happen in a short time. If buds are inserted early into very luxuriant trees it often happens that they make young wood in the fall to the injury of the process ; this happens owing to a bud of a weaker kind of tree being inserted into a stronger, which feeds it with a superabundant flow of sap, and hence causes vegetation at an improper season.

ART. 5.—*On the Flower or Blossom.*

Some attention should be paid by the cultivator to the flowers of fruit trees ; because from them comes the fruit, and unless the blossoms are strong and perfect, the fruit will be imperfect ; for we often see in stone fruit for instance, that it is destitute of the stone, which is owing to the flower setting its fruit without its organs of generation being perfected by the *farina* ; in this case it is destitute of its proper qualities and flavor. It is quite requisite that the flower buds of trees should be well matured in the fall in order that they form all the different

parts of fructification, in a healthy and proper state. In many cases I have seen peach trees blossom in the spring destitute of the organs of fructification, and hence the flowers have dropped off without forming fruit. This has been owing to a poverty either by drought, want of air, or feebleness at the time of forming the buds, and hence the failure. The blossoms of fruit are also often injured in the time of flowering by frost which settles on the tender parts; when the sun shines strongly on them it scalds the blossom so that the flower drops off. This is often seen in the peach and grape in seasons when late frosts happen; and in such seasons it is rarely that crops of fruit are abundant. Winds, much wet, or sudden changes from heat to cold, are injurious to the blossoms of fruit trees.

Blossoms of fruit generally set best when the heat, moisture and air are uniform and corresponding to the natural properties of the tree; anything that is very changeable generally retards its progress.

Tender kinds of fruit, as the peach and grape, may be protected, by covering the trees when in bloom with thin grass-cloth, netting, or other woven thin substance that will admit the sun and air through the meshes; this slight covering, although not sufficient to guard off severe frosts or storms, is of the greatest importance in moderate cases, for the meshes attract slight hoary frost which settles on it, and besides it acts as a screen from the sun when it shines strongly on the tree after frosts.

To be explicit on the subject, it is important in all cases that the blossom should be vigorous, and have everything by nature to *set it strongly*, in order to obtain a good produce.

ART. 6.—*On the Fruit.*

After what has been said of the buds and flowers of trees, it will be proper to say something on fruit, which bears the same affinity as regards being supported in a healthy state from the tree, which should be in good health or the fruit will be of an inferior quality. In many cases we find trees to flower freely and set their fruit, which afterwards drops from the tree in different stages, owing to many causes inimical to it. Fruit of tender kinds is as often lost in its infant state by frost, as when in flower; and in most instances it may be protected in the same manner. A natural weakness in the tree is sometimes the cause of fruit dropping from it; another cause is its being too luxuriant, as in the case of young trees, which often make their shoots so luxuriant as to impoverish the young fruit. In this case it is evident that to counteract either difficulty, the tree should by culture and management be kept in a state that shall cause it to have a uniform growth and health neither too weak or too luxuriant; this can be effected by the different processes recommended to be practised hereafter, as pruning, manuring and working the soil. The thinning of fruit is also essentially necessary, in order that when it is too thick it may be so thinned as to grow to and have its proper size and quality; for an explanation of this I refer the reader to its proper head.

Many crops of fruit are lost when in a state of growth by the drought, especially on dry soils, which when deprived of moisture afford no nutriment to the tree. In this case fruit often forms itself into a monstrous habit; thus the plum swells to

a large hollow white pulp without either its proper substance or quality, and drops from the tree a diseased crude substance. Cherries, plums and most kinds of stone fruit often drop from the tree while forming their stones, when the season is dry or unfavorable, and the apple and pear form into an ill-formed gnarly fruit during the drought. Too much exposure to the sun affects some fruit, as the raspberry ; while others, as the grape, by being too much shaded, are prevented from obtaining their wonted qualities. In fact the orchardist must endeavor to make himself familiar, by practical observations, with the different causes that operate either favorably or injuriously to fruit. Such observations are worth all the theory that can be penned by the most scientific writers on the subject.

PART SECOND.

MANAGEMENT OF THE NURSERY.

CHAPTER I.

ON LAYING OUT THE NURSERY.

ART. 1.—*On the Selection of the Ground.*

UNDER the head of Nursery I shall take into consideration the culture of fruit trees in their infant state, and in order to condense the subject, I shall confine it strictly, to a piece of ground adapted for raising young fruit trees in a healthy vigorous state for replanting in the Fruit Garden or Orchard.

The selecting a piece of ground for a nursery is of more importance than is generally considered, because, young trees should always be well grown, which is to say, in a healthy and symmetrical manner, and hence the name Nursery.—Whilst on this part of my subject, I cannot refrain from making some remarks on the very improper modes often adopted in raising young fruit trees, especially in country places. Many persons who have land to spare, think that to appropriate a spot to the growth of young trees, and merely to plant, inoculate, &c., is all that is needful to produce good

plants ; hence trees are planted out in their infant state, and allowed to take their' chance with weeds, grass, and the like incumbrances, that accumulate and impoverish them, and the consequence is, that they are dwarfed into a meagre growth when young, and are in a measure deterred from ever attaining a full and vigorous growth and habit.

Unless trees can be properly grown and well attended to, a nursery never will answer either for profit, or as a plantation from which it is intended to transplant into a fruit garden or orchard.

In selecting a nursery, the ground should be chosen in a sheltered situation, protected from the north and northwest winds. Shelter indeed is one of the principal objects to be regarded, for in most cases, young trees have great resemblance to young children, or anything in its infant state in the animal kingdom ; they require a degree of warmth and shelter to assist their formation into a thrifty habit : indeed in many cases, trees although not possessing motion or sensible qualities, are very similar to animals, for we find it to be the case in the vegetable kingdom, in trees more especially, that the young are fostered under the influence and protection of their parent, which acts as shelter and protection to its offspring for awhile, and whilst the parent is going into an incipient decay, the offspring is gaining vigor and magnitude, and finally like the Phoenix is fostered, fed, and formed from the remains of its parent.

But to return to my subject ; the ground should be of a naturally rich soil, approaching to a mellow loam, with rich mellow subsoil, that will retain moisture in a moderate degree, but not in such a manner

as to saturate the surface soil with moisture, which will chill and destroy the roots of the young trees ; a part of the nursery may be on a dry location to grow such trees as are natural to a dry soil, as the cherry, peach, &c. *The location should be such that the surface water may run off after snow or heavy showers, that it may not too much saturate the ground; nor should it be so situated that drought affects the ground severely, two extremes that often happen, and are very injurious to the growth and health of trees.*

ART. 2.—*On preparing and laying out the Ground.*

The preparation of the ground selected for the nursery, should be done in the best possible manner, by clearing it of any weeds, manuring and ploughing it deep ; and every thing that applies to good culture, should be done to bring it into a right state previous to planting. Let it be remembered, that if weeds are once allowed to grow rank among young trees, they not only impoverish them and the ground, but it is very difficult to exterminate them therefrom.

It is a good method to break up the ground one year previous to planting, and manure all over and cultivate a crop of potatoes, which will clean and bring it into excellent order.

Laying out the Nursery, is simply to divide the ground into squares appropriate to the size. It should be laid out in a regular and systematic order, so that an easy access can be had to any trees when wanted, without confusion. The most general and best plan of laying out the nursery, is to

lay out a border of twelve or fifteen feet around it, and a walk next to it of six or eight feet, and if the nursery is large, a broad walk of twelve or fifteen feet may be made, up the central part, for the accommodation of a cart or wagon to take away or bring any trees, soil or other things belonging to it in the most convenient manner.

CHAPTER II.

ON THE INCREASE OR PROPAGATION OF TREES.

ART. 1.—*Increase by Seed.*

It should be a general rule to propagate many kind of the trees by seed, although suckers are in many cases substituted for it ; the pear, the apple, the plum and cherry, are the principal families of eatable fruits, and are extensively cultivated as a matter of profit, and as these are of such importance, it is quite clear that the best possible manner of growing trees should be resorted to, in order to give the cultivator a due return for money and labor expended.

The greatest error in cultivating the above named varieties of trees from suckers is, that they are prone to throw out suckers from the roots of the parent tree which acts as a *nurse* for awhile, to a numerous progeny of young offsprings, which in time draw nutriment from the surrounding earth, and impoverish the parent. If these suckers are cut off from their parent roots, the number is trebled yearly

and the oftener they are cut off, the more numerous they grow. Seedling trees seldom throw out suckers from their roots, and hence it is essential to grow trees by seed in order to evade a perpetual trouble, besides having most generally better crops of fruit.

The method of raising young seedlings, is to prepare a piece of ground by digging and manuring it well either in the fall or the spring, but the spring is generally considered the best. Having the grounds prepared, the seed may then be sown either in four feet beds with two foot alleys, or in drills of about six inches wide and a foot between. The latter I would recommend, for by this method the young plants will have a better chance to obtain the sun and air, and grow more stout and bushy, than when grown in a thick bed of four feet wide. The seed may be sown in depth according to the size. Such as apple, pear, and the small kinds of seeds may be sown very shallow, and lightly covered by sifting over it some fine rotten leaf mould, or other light earth, with a portion of decomposed vegetable matter incorporated in it. Peaches, plums, nuts and large hard shelled seeds will require to be sown deeper in proportion. Such seed should be previously prepared by mixing it with earth in the fall, and keeping it in tubs or boxes during the winter, in order to soften the shells. Many kinds of berries, as mountain-ash, hawthorn, and the like, may be treated in the same manner.

If the fall is the most convenient time for doing this business, there is no objection to doing it in a proper manner, and so much of the nursery busi-

ness of the spring will be forwarded ; when seed is sown in the fall, it should be on a piece of ground where it is not subject to be inundated or covered with water, which *rots* the seed in the ground, and is an almost sure cause of failure ; therefore the choice of ground is of great importance.

ART. 2.—*Increase by Cuttings.*

There are many kinds of fruits which are increased by cuttings, as the grape, the currant, the gooseberry, &c. The manner of doing this is, to prepare a piece of rich mellow ground by spreading over it a quantity of well rotted manure and digging it neatly with a plate spade ; this being done, the cuttings are then to be prepared by cutting them in length of about a foot, with a sharp knife ; the ground being prepared, the cuttings may be inserted, by placing a garden line and pressing them down about half way into the ground by the side of it ; when one row is completed, the ground is to be neatly raked by the side of it, and the line removed to the intended distance between the rows, when the next row may be planted in the same manner, and so continue until the whole is completed.

The selection of cuttings for this purpose, is of some importance, as healthy or meagre plants will be made according to the choice. The cutting should be chosen from the young wood of last summer's growth, and that which is strong, straight, and healthy. It should be, if possible, taken from a part of the tree, where it has been well exposed, so that it is well *ripened* ; if taken from the centre of the

tree, where the shoots are thick, they are oftentimes soft, and succulent, and hence improper.

The choice of ground for this purpose, is very important : it should, if possible, be chosen in a shady place, where the sun and air can have free influence ; the soil should be of a rich light loamy nature, with a portion of sand, in order that the cuttings may *callous*, and root more freely.

ART. 3.—*Increase by Layers.*

Many kinds of fruit trees, as the currant, the gooseberry, grape, &c., are increased from their parent, by layers ; this business is generally performed in the spring, although, in some cases, the fall is preferred, in order to forward the business in the spring. However, the spring is the most to be preferred, as at that time the layers strike root much more freely ; besides, the business can be done much more expeditiously.

The most general method of performing this business, is to prepare the earth around the parent plant by digging and well working the ground ; this done, the layers are to be chosen of young slender shoots, and if of one year's growth the better, but if of thrifty growth, two or three years' growth will do. Having selected out the intended layers, bend them gently down to the earth's surface in an opposite direction from the part in the plant they grow in ; this done, make an incision with a sharp knife for the part that they may throw out roots.

The incision or cut is made by placing the heel of the knife to a bud, (at a distance where the shoot can be conveniently laid in the ground,) cutting the

shoot about half way through, and bringing the blade upwards about an inch, with a clear cut, so as to form a tongue to the part laid in the ground, to send out roots. This done, press a spade six or eight inches in the ground, into which, insert the layer with the cut part or tongue downwards, and close over the part with earth, pressing it down with the heel, and if the shoot is stiff, it may be secured in its place, by placing over it a pegged stick and pressing it deeply in the ground. When the layers are all laid, the ground may be regularly placed about them, and neatly raked or dressed off.

When many plants are desired to be thus raised, I recommend that a piece of ground for the desired kinds be purposely selected, and *stools* planted about three or four feet apart. By this mode a regular succession of layers is obtained every spring from the last year's wood, which is thrown up from the crown or centre of the stool.

I would particularly recommend this mode to be adopted for the *Isabella* grape vine, by which much finer plants are obtained than by cuttings or any other method in one year.

ART. 4.—*Increase by Inoculation.*

The cherry, plum, pear, and many other kinds of fruit trees, are increased by budding or inoculating. In order to the success of this method the plants to be operated upon should be grown and in a thrifty state when worked, else little reward may be expected for the trouble. When it is recollected that the *bud* inserted, is to be united to the *sap* in

the shoot, it must be at once evident, that it should be in the very best state in order to form an union ; to the contrary of this, we often see trees operated upon, that are old and dried up, or have no sap to feed the inserted bud ; the success of such operations require no inquiry or consideration further than that it is certain that the result will be useless, and the trees where the incisions are made, will be scarified and disfigured. Therefore, when budding is intended to be done, the principal object should be to choose young healthy wood, full of sap.

The mode of Inoculation.—Having the trees of the above healthy description, and the proper season being at hand, the business may be done in the following manner : at the proper season, when the plants to be inoculated are in a right condition, prepare for the operation by collecting healthy shoots of the summer's growth, of such kinds as are intended to be increased. When the shoots are taken from the trees, they are to be divested of their leaves, leaving a part of the forestalk to the length of half an inch ; they are then to be kept damp until they are inserted, which should be as soon as possible after being separated from the trees.

There are many ways of inserting buds, but I shall confine myself to the most general, and, I believe most successful method, which is performed by making an incision in the tree intended to be inoculated, in this form, T, by first cutting through the rind, on the top, in a transverse manner, holding the knife between the fore finger and thumb : the bottom incision is made by drawing the point of the knife downward an inch ; the thin end of the haft is

then to be applied to the top of the incision in order to part the rind from the wood, which is done by gently lifting the top and running the end of the haft downward on each side to the end of the incision. The incision being made for the reception of the bud, the next thing to be done is to prepare the bud, by placing the scion in the left hand, between the fore finger and thumb, with the top end next to the thumb. The knife must then be taken in the right hand, and its heel placed half an inch below the bud intended to be taken off; it is then to be carefully drawn upwards half an inch above the bud, cutting it out with about half the wood and bark. This being done, the part is to be placed between the thumb and fore finger of the left hand, and the rind gently pressed back with the edge of the knife, when the wood is to be pinched between the thumb and knife and divided from the rind with the bud, which is to be inserted neatly in the incision by pressing it gently down between the bark and the wood of the tree, and bound with bass or other string, in a neat manner, beginning first at the bottom of the incision, and then continuing it to the top over and above where the cut is made.

ART. 5.—*Increase by Grafting.*

The object of grafting is to prolong any desired fine quality of fruit by uniting it to a healthy, vigorous kind, which should generally be such as is grown from seed. In this manner fine kinds of the apple, pear, cherry and plum are prolonged through many generations, which could not be done by seed, for seed from the very best kinds generally returns

to varieties similar to the parent crab-apple. The methods of grafting are numerous, but there are two only generally followed, namely, the cleft-graft, and the whip-graft. The former is principally practised on large trees, and indeed in the nursery department in this country ; but the latter is universally practised in the nurseries of Great Britain and other European countries.

The scions selected for grafting are those of the last year's growth from the fruiting wood. Suckers from the central part are by no means to be chosen if they can be avoided. The cuttings should be taken from the tree about the beginning of March and tied in bundles, and placed into the earth in a sunny and sheltered situation. The time of grafting depends on the nature of the season, but generally the beginning of April is a good time. When the sap begins to flow freely is the best period, which, can be easily ascertained.

Cleft-grafting.—Having the scions prepared as before directed, a quantity of grafting-clay, composition, or other proper covering may be prepared previous to performing the work. The grafting-clay is prepared by collecting a quantity of stiff clay, and moistening it with water to the consistence of stiff mortar ; into this a quantity of short cut horse hair, moss, horse dropping, or other substance may be mixed to thread it together in a manner that it will act as a plaster, not to be easily removed from the tree by rain, sun, or other cause when once put on. This composition, if well made, is the best, and will be found to answer for any kind of grafting.

There are many other kinds of composition made for the purpose of covering grafts, of which bees-

wax is the principal ; in some instances it is the only thing used, as on small orange trees and those plants that are cleft-grafted, and united in a moist heat. It is used by melting and putting it thinly over the wound with a brush, or even the finger. A very good composition is made by mixing a portion of bees-wax, pitch and glue, with a little hog's lard, and well boiling it together in an earthen pipkin. When used, it is laid in with a brush hot, but not so as to scald the bark.

In the act of grafting, fix on a clean part of the stock or branch to be worked, sawing off the branch in a clean manner, then paring the wound with a sharp knife, being careful not to bruise the outer bark : this done, prepare to make a cleft by placing a straight stiff bladed knife directly across the centre of the cut, and with a mallet or other tool cleave the crown two or three inches. Having made the cleft, open it by driving down the centre a narrow wedge of iron far enough to open the sides sufficient to receive the grafts, which are prepared by cutting them in lengths about six and eight inches long—cutting the bottom ends downwards, on each side, in the form of a wedge, and so that it fits neatly in the cleft, into which it is to be gently pressed downwards, being careful that the barks of the graft and the stock precisely meet. The cleft part is now to be covered in such a manner that neither sun nor air can have access to the parts of the graft and stock to prevent their speedily uniting. The clay is put on with the hands and closely united to the bark by pressure. When neatly done, it should have the appearance of an egg, and should let off the water freely that may settle on it.

Whip-grafting is generally performed on small nursery stocks, and although not generally practised in this country, I think it a mode highly commendable for the plum and cherry, grafts of which generally do well on small stocks.

The method of performing whip-grafting is by cutting off the stock at the place selected, in a clean sloping manner ; then, with a sharp budding knife, from the smooth part next to the lowest part of the cut, shave off the bark and wood about two inches long, beginning at the bottom by drawing the heel of the knife gently in the bark and gradually cutting deeper in the wood until the blade is drawn out at the top. The graft is prepared by cutting it in a sloping manner in a reverse position, so that when placed on the cut of the stock it forms a neat splice. Some gardeners recommend cutting a thin tongue in the graft upwards, and in the stock downwards ; these two tongues are united into the stock and the graft by pressing the latter downwards into the former ; when the union is effected the outer bark of the graft and stock will precisely meet, and the splice in every way exactly fits ; this indeed is the grand art in performing the operation. When the graft is set, it is to be bound with bass-string, beginning at the bottom and winding it upwards in a gradual manner, When the graft is bandaged, it is to be covered with clay or other composition in the same manner as directed for the cleft-graft.

ART. 6.—*Inarching.*

Although inarching more properly belongs to the green-house than the fruit department, it will be necessary to say a few words on the subject in this place.

The object of inarching is to form a safe and speedy union of any choice variety of hard wooded plants or trees on to a wilding or stock of the same genus or species ; and the practice is generally adapted to those kinds that do not speedily unite by engrafting ; this is greatly facilitated by inarching, as the parts are always united, and a continued flow of sap almost always ensures a certain union.

The practice of inarching, is simply done by planting or placing a number of the stocks to be worked around the tree to be worked from, in such a manner that the branches can be easily united together.

The operation is done, in the spring, about the same time as grafting—when the sap begins to rise in the tree is a proper time. The work is done by bending a shoot from the tree intended to be worked to the stock, where it is to be united in the following manner. Place the part of the shoot to the stock, then with a sharp knife pare off part of the branch and stock so as to make a neat splice in precisely the same manner as the whip-graft ; the part united is then to be bandaged and covered as the graft, and in every way managed in the same manner.

CHAPTER III.

ON THE MANAGEMENT OF YOUNG PLANTS.

ART. 1.—*Seedlings.*

THERE is some care and attention required to grow seedlings in a strong and healthy state the first year, which is of great importance to their after growth ; for when seedlings are not well grown the first year, they are often stunted into a meagre growth that prevents them from making any progress the following year.

When the young plants begin to break the ground and make their appearance, any heavy lumps of dirt, stones or other substances that impede their growth may be taken away. If the weather is very dry at this time, the plants may have a good soaking of water given to them two or three times of an evening. When the plants have two or three leaves, the beds may be thinned by pulling out those in clusters, and leaving them as regular as possible, an inch or two apart—being careful always to leave the centre part of the bed the thinnest, as it must be recollected that the plants in the middle do not have the chance to obtain so much air as the outside. As the young plants advance in growth, the beds should be regularly looked over, and divested of any weeds, filth, or anything that may retard their growth, and every thing should be done to encourage a healthy growth during the summer.

In the fall, if the plants are to remain in the seed bed for another year's growth, before they are planted

into nursery rows, (which is much the best method,) they may be protected as directed under the head of "fall management in the nursery," and so during the winter; and in the spring they may be prepared for a summer's growth.

The methods of management of seedling trees, like other processes in horticulture, are various. I shall describe that which from practice and observation appears to me to be the best, and leave the proof of its correctness to the inquiring practitioner.

The two principal objects to be kept in view in the growth of seedlings the second year is, to cause them to form a number of branching fibrous roots and to enlarge in the main stem or stock a little above the ground, where engrafting is to take place when planted into nursery rows. These two essential points are often not only disregarded but opposed by allowing seedlings to grow thickly together the second year without any restraint or management, and the consequence is, that they grow into long slender stems without acquiring bulk and substance at the proper place, the base of the stem; the top is superabundant, and the roots are contracted to merely a tap root, which running into the subsoil forms fibres where they must be severed from the plant when removed.

The management I recommend for seedlings the second year is, to look over the bed and thin out the plants to three inches apart, leaving the most healthy plants in the bed. This done take a sharp plate spade, and placing it in the ground six or eight inches from the outside of the rows, press it under them five or six inches; then press it underneath the plants to the centre of the bed in such a manner

as to cut asunder the tap roots of the plants ; proceed to manage the other side in the same manner. By cutting asunder the tap roots, the plants immediately form side or lateral roots near the surface, with fibres. The luxuriant shoot that would be made if the tap root were allowed to remain is retarded, and the stock swells in bulk at the base according as the branching roots are formed, and in the following spring by this method a plant is obtained having plenty of fibrous roots and a stout stem.

The young plants that are taken from the seedling bed may be planted thickly in a row in a rich soil to form themselves into good plants for transplanting the ensuing spring.

ART. 2.—*On the Management of Cuttings.*

Great care should be taken of cuttings in the Nursery, as grape, gooseberry, &c. ; they should be kept perfectly clear of weeds, that they may not overgrow and impoverish them ; this can be effected by hoeing, raking and dressing the ground. Care should also be taken that the earth is not too loose about them, so as to let the drought into them, which would deter their taking root ; if the weather proves very dry about the time they begin to grow, and water is convenient, the rooting will be much facilitated, by giving them a good watering two or three times early in the spring. Or it is a good method to *melch* over the ground between the rows with short litter, or if moss can be obtained, it will answer an excellent purpose to help to retain the moisture. If neither of these can be obtained, the ground should often be hoed between the rows, in

order to attract the moisture from the atmospheric air. In the fall it is a good method to strew some short manure or rotten leaf mould on the ground near the stems of the cuttings, in order to guard them from the frost, which often draws them from the ground.

The second year the young plants may be pruned, by thinning out the tops or heading in the young shoots to an eye, leaving three or four eyes on each plant, as the gooseberry, currant, and the like shrubby dwarf growing fruit trees which form compacter and handsomer trees by being headed down in this manner. If the plants are weakly, some good rotten manure dug in between the rows, will greatly facilitate their growth the second year. When the plants are of a sufficient size, they may be planted out as other trees from the nursery, into the department assigned them for fruiting.

ART. 3.—*On the Management of Layers.*

The principal management requisite for layers after they are put down, is to keep them regularly moist during the growing season, that they may throw out roots from the incisions made in a freer manner early in the spring. In dry seasons this is much facilitated by covering the ground all over (where the layers are inserted) with short manure, or a better substitute is a quantity of long moss which can be obtained from the woods ; this is an essential point in nursery business, little attended to, although of great importance. Any person must be aware, that plants, in the act of throwing out young roots, should have every encourage-

ment to forward the progress, for it is, in most cases, taking the young from the parent before it has sufficient strength to support itself in a vigorous state that causes failure ; therefore, anything that can be done to strengthen it, is essentially necessary.

In the month of August, when the layers are well rooted, which can be ascertained by examining them where the incision is made, they may be cut from the parent plant, by cutting asunder the part between the parent and the part layered in the ground ; this, I consider of high importance, as the layer will have time to be fully established in the ground on its own bottom, before the fall, and be independent of its parent. But care must be taken not to cut the layer from the parent before it is well rooted, *especially* in dry weather, for by so doing, oftentimes the young plants are totally lost. A judicious cultivator will be able to determine on this part by examining the layers.

In the spring, the layers may be taken from their parent, and planted out either in nursery rows, or in the place designed for their final fruiting. Care must be taken not to take away any layers from the parent, unless they are well rooted ; many plants are destroyed for want of care in this respect. Leave such plants on the stools for another year, to get well rooted.

ART. 4.—*On the Management of Buds.*

After inoculation has been done in fruit trees for three or four weeks, the buds inserted may be looked over, and any that are beginning to swell in the bark so that they are cut by the bandage, may be released

either by taking it totally off, or releasing the bud by loosening it. This is essentially necessary to be done, as in many cases, buds are totally lost by being cut with the bandage. Buds should be carefully looked over every few days, until the fall of the leaf, as at that time the *descent* of the sap will be completed. Many persons make it a rule to take off entirely the bandages from buds when they are taken or fully united to the tree. Others, on the contrary, leave on all the bandage during the winter, to protect the bud, and some take off the bandage when the buds swell, and rebind with new *bass* for the winter. It is difficult to decide on which of these methods is the best, and we must be guided in a measure by circumstances, as to which will answer the best purpose. For my own part, I think that it is best to pay great attention to buds when they begin to swell, as the sap descends ; and the best method is to loosen the bandage at different times, to give the buds room to swell ; I think also that the rebinding of the bud in the fall with a view to protect it during the winter, is, in many cases, of an essential service ; for we often see buds winter killed, owing to the severity of the winter, by springing the bark off of them, and the lip off the cut in the stock. In the following spring, the top of the stock may be cut off, about six inches from the bud, and if any bandage be about it, it should be taken away, that it may not be cut when it commences to grow ; the part left above the bud is intended to tie the young shoot to, and protect it from being blown from the stock in summer when making rapid growth.

Summer management.—When the buds begin to

make their summer shoots, the trees should be gone over and divested of any shoot that may grow from the stock ; which will impoverish the growth of the bud intended to form the head of the tree. When the shoot from the bud is some inches long, it may be tied to the stick (before mentioned) with bass or other string, in a manner to guard it against storms or winds ; in this process, care must be taken that the strings are not tied too tight, which will cut the young wood ; every attention should be paid during the season, to the growth of the young wood, by keeping off any insect, taking off the dead leaves, and the like. In the following spring, the *snag* or piece of dead wood left above the bud to protect it, should be *cut* off neatly close to it, so that the wood heals freely.

ART. 5.—*On the Management of Grafts.*

The principal care required in grafts, is to look them over in the spring, and to see that the composition or covering remains in a safe state ; and, if there be any of the bandage either falling off by accident or otherwise displaced, it should be immediately replaced, that the air may not have access to the wound where the graft is united to the tree, which, in most cases, is the cause of a failure. When the graft is united and begins to make a growth, the bandage, if bandage has been used, may be taken off to prevent it from cutting the graft, which in many cases, is the cause of its being blown from the trees in stormy seasons, as the *bark* and wood is often in this case cut nearly half asunder by the bandage. If the grafts grow very luxuriantly in the spring,

they should be protected by tying a small stick to the branch grafted in, in such a manner, that the graft can be tied to it, to support it from storms, and winds.

In the following spring, the grafted trees may be looked over, and any young suckers growing from the stock or tree that may be liable to injure and retard the growth of the graft, may be taken off. Any decayed bark or snags near the bark that is either useless or a nuisance, should be cut away, and the tree should in every part be properly and *neatly* pruned.

ART. 6.—*On the Management of the Inarch.*

Where trees are inarched, they require to be often looked over, as the branches inarched, are often displaced by storms and winds. Every care should be taken to keep the soil around the roots of the trees or plants inarched in good order, by digging in manure and keeping them moist. This is very essential, because the healthier the plants worked are kept, the better will they unite together; it should always be recollected, that plants should be kept in the best possible state of health, when either budded, grafted, or inarched, because when a free flow of sap is kept up, then the union of the two parts by the sap takes place much more speedily.

After the plants have been inarched two or three months, they may then be examined, to see if they are well united, which if it has taken place and a perfect union is made of the inarch and tree, it may then be cut from the parent plant by cutting asunder that part between the stock and the one from

which the inarch is taken. It is well here to give a caution to the young practitioner, not to do this too soon, as in that case it is often seen that the inarch is lost ; it should not be done until a good union has taken place.

CHAPTER IV.

SPRING MANAGEMENT IN THE NURSERY.

ART. 1.—*Heading down Young Trees.*

THE heading down of young trees is the first thing that can conveniently be done in the nursery in the early part of the spring, and should be attended to before the ground is sufficiently open for drawing trees, and such as comes under spade work.

Budded or inoculated trees, as the peach, pear, and the like, may be first done by cutting down the wood above the bud six inches or a foot, leaving a part of the stock above the bud for the purpose of tying the young growth made from the eye ; trees worked the year previous, may have the piece of wood left above the bud (which is now of no use) cut close to the bud in a neat clean manner, so that it may heal freely. In performing this business, care must be taken to take away any useless shoots from the tree below the bud, that will draw substance from and impoverish it. Any trees that are intended to remain in the nursery another year and that are intended to form bushy heads, may now

be headed down close to the bud or graft, cutting each shoot down two or three eyes, which will throw out luxuriant shoots, and form it to bushy rows. At this time most trees may be headed down and pruning performed, as directed under its proper head.

ART. 2.—*Drawing Trees.*

The drawing of trees may be commenced when the frost is out of the ground, so that the spade can be worked freely. It is very rarely that there is sufficient pains taken in drawing trees, which can be accounted for in different ways ; in the first place, the season is so short when it is to be done, that the haste to complete the business of drawing in a nursery is often some excuse for the improper manner in which it is done. However, there can be no excuse for the cutting off all the fibrous roots of trees in a manner that they are valueless, or so much injured, that it will take two or three years before they can re-establish themselves, so as to make a luxuriant growth. In the act of drawing young trees, every care should be taken to take them from the ground in such a manner that they may retain as much as possible, their roots in their natural state, and that the fibrous roots are not cut off. In taking a young tree from the ground, the first thing to be done, is to take out the soil a spade deep or deeper than the roots on one side of the tree, at such a distance that the roots may not be cut too short ; this done, the tree is to be gently pulled on that side to draw the top roots tight, which are to be cut by spading round in a circular manner on the opposite

side at such a distance that when cut they may be of sufficient length to support the tree.

ART. 3.—On Clearing and Digging the Ground.

When the trees intended to be taken up are all drawn, the trees headed down, tied up, and the like operations are completed for the spring, the ground should be cleared of all kinds of brush, rubbish, weeds, &c., and neatly dug to complete the spring business. Every part of the squares, borders and walks, should be cleared up at the earliest opportunity ; if deferred, it will be likely to interfere with the whole nursery business for the summer season. When the ground is cleared, every part of it should be neatly dug. In digging the ground for planting out young seedlings, if the ground to be planted is naturally poor, some good rotten manure may be added, and spread regularly over the ground. This done, a trench of one spade deep and wide, may be taken out at one end and wheeled to the other ; this done, commence digging regularly across the piece turning the earth from the shade upside down, and leaving the surface rough as it leaves the spade. The method pursued by many persons, of working the surface of the earth fine and even, is bad, because the rains beat down the surface hard, and in a great measure, prevent the sun and air from exerting their influence on the roots of the trees when planted. The ground also becomes baked hard and is more troublesome to work with the hoe than when left in a rough state.

ART. 4.—*On Planting out Seedlings, &c.*

When the nursery is cleared of rubbish, the ground dug, and preparation made, the planting out of seedlings may be done in the following manner : the ground being prepared, the first consideration is the distance the trees are to be planted apart, between the rows, and in the rows. This must in a measure, depend on the kinds to be planted, and the time they are to be allowed to grow in the nursery. It is rather difficult to decide on this *very important point in the nursery business* ; for it is certain, the distance allowed for the growing of young trees in their *infant* state, has a great bearing on their forming into a *proper* state for a bearing tree. The distance allowed between trees in the nursery by many growers, I consider to be too great, as the object of many persons is to cultivate between the rows with a horse, in order to save expense. This, I consider bad economy, as in the first place, much ground is occupied ; and secondly, there is much surface of ground to cultivate, which gives additional labor. By trees being too far apart in their infant state, they neither grow nor form into healthy vigorous plants. Young seedlings should be planted sufficiently thick, so that the ground may give a good revenue when they are taken from it. If it will not admit of this by the best cultivation, the business is not worth pursuing. I am well aware that this view will be opposed by many on the ground that the more a young tree is exposed and the less it is nursed in its infant state, the better it will thrive when exposed and planted for bearing. If this be true, a “Nursery” is a misnomer, and culture use-

less. And if we call in nature for a decision, we shall find that young seedlings of all denominations of trees, always form into the most *stately* habit when chance places the seed in a rich soil, where it is partly secured from cold blast by a natural protection ; and where the soil is uniform in moisture, that it is to say, not inundated by *wet* or parched with *drought*, as the natural changes of the weather may happen. For most kinds of young trees to be planted in the nursery, as the apple, pear, cherry, &c., the distance of two feet between the rows, and eighteen inches in the row, will, I think answer a good purpose. Other trees of a more dwarf habit, as the plum or peach, may be planted thicker, according to their size ; which can be judged of by an intelligent person.

CHAPTER V.

SUMMER MANAGEMENT IN THE NURSERY.

ART. 1.—*Hoeing and Clearing the Ground.*

In the month of June or July, or as soon as any weeds begin to make their appearance, every part of the nursery should have a good hoeing, and if there be any large weeds of the perennial kinds, as couch-grass, thistle or such troublesome cumberers of the soil, they should be immediately taken from the ground and either burnt or taken to some place to rot and decay, to be again returned to the soil as

manure. Advantage should be taken to do this kind of work on fine, dry days when the weeds may perish shortly after being severed from the soil : and if there be a quantity of seedlings it will be well to give the ground a good rough raking after the *hoe*, to bring the young tender weeds on the surface of the ground, in order that the sun may act on them and that they may shortly die, and not again re-establish themselves in the soil. At this time also every walk should be examined, hoed and cleared, so that every part of the nursery has a clean and orderly appearance.

The trees should also be gone over and divested of any insects or other nuisances that retard their growth.

ART. 2.—*Summer Pruning and supporting young Trees.*

When young trees have nearly made their summer growth, which is at the end of July, or beginning of August, they should be pruned of all useless shoots ; for this purpose a sharp knife may be used, and great care should be taken that the wounds are cut *clean* so that they may heal freely. When the incision is badly done with rough edged tools, it is seldom that they form a callous readily, and often the part becomes cankered, turns black and is otherwise injured, so that the connecting limbs or plants are affected, and from thence in many cases the injury extends to every part of the tree. Where trees are intended to be made standards of five or six feet from dwarfs that have strong leading shoots, this is a more proper time to prune off the under

shoots than either the fall or spring, for the wounds heal more freely, and the currents of *sap* flow more abundantly to the top of the tree, as it is not retarded and retained so much in its ascent by the under shoots.

Newly inoculated and grafted trees should now be carefully looked over and any luxuriant shoots, that are impoverishing the bud or graft should be taken from the tree. This is a part of nursery business generally too much neglected; for in many instances inoculated and grafted trees are neglected by allowing young wood to grow from the stock under and over the graft or bud, and the consequence is that the buds or grafts are impoverished by being deprived of the sap which should flow into them from the stock. Every attention should now also be paid in disbudding or breaking off useless growing wood, and cleansing the trees from insects as they appear.

When young trees are slender in their growth and require to be supported by stakes it should now be done, by placing straight stakes of a convenient height near to them, and the slender shoots may be tied up in a neat manner with bass or other strings: indeed everything should now be done in the supporting slender branches of trees, pruning, &c., required in the nursery.

CHAPTER VI.

FALL MANAGEMENT OF THE NURSERY.

ART. 1.—*Destroying Weeds in Autumn.*

MUCH of the success of the nursery depends on the fall management, which by many persons is little attended to. To clear the ground in the spring and summer has but little bearing on the well being of young fruit trees, if they are is not well attended to in the fall ; for when weeds are allowed to remain and distribute their seeds on the ground, in the fall, the nursery may be considered more a nursery of weeds and nuisances, than a spot of ground adapted and managed for the growing young trees in a healthy and vigorous state.

Supposing the fall management to begin with the month of September ; the principal thing to be done at that time is to clear the ground of all kinds of weeds that are in a state for seeding and encumber the ground ; the cultivator should also be aware that weeds when taken from the ground before they have seeded, do not exhaust the soil of nutriment so much as when they have become ripe ; for when weeds are even cut off when green and the roots remain in the ground, they absorb from the atmosphere much nutriment which they return to the soil. Hence the propriety of clearing the ground of them is not to be doubted, therefore at this season clear the ground of all kinds of weeds and anything that may either be considered as a nuisance, or creative of vermin or

insects, or any thing that may in future be an injury to the plants.

And here let me remind the cultivator that it is in the fall that many kinds of insects are concealed in a *chrysalis* state, and are there awaiting the return of spring or the stronger influence of the sun to hatch them into life. Most of the old kind of decayed vegetables, especially those of a gross porous nature are the very cradles that hatch many kinds of insects into life, and lull the dormant *chrysalis* during winter in protected repose. Hence it is evident that the removal of such nuisance is indispensably necessary, in order to counteract a greater evil.

ART. 2.—*Covering and Protecting Trees.*

Many kinds of young and tender trees, require to be protected or guarded from the winter's severity, as the foreign grape, young seedlings, cuttings, and those plants that are not well established and rooted into the soil. The time of doing this is generally about the middle of November or a few days previous to the setting in of the winter. The grape vines and raspberry canes may be laid down into the ground as directed under their proper heads of culture of the grape. Seedlings may be protected if in narrow beds, by placing a quantity of leaves among them and then throwing on each side a quantity of light earth in order to keep it compact about their stems. Young cuttings or other dwarf plants that require protection may be secured by placing about their stems a quantity of rotten manure, leaf mould, or other substance about six or eight inches high, so as to well protect the roots and keep the feeble

plants from being drawn from the ground. Any kinds of trees that require protecting during the winter in their branches may be done at this season, according to the methods laid down under the article of "Protecting Trees" in the Miscellany. Indeed everything should be done at this time preparatory to the coming winter, in the neatest and most careful manner.

Many kinds of dwarf trees, that are too tender to be exposed to the winter may be protected above ground, by placing straw or an old mat about their branches, and binding it closely either by a strong string or wisp of osier or other tough pliable wood.

PART THIRD.

THE FRUIT GARDEN AND ORCHARD.

CHAPTER I.

ON THE MANAGEMENT OF TREES.

ART. 1.—*On the Selection of Fruit.*

IN the selection of the different kinds of fruit, the orchardist or planter should consider that the planting of fruit is not merely a temporary speculation ; but, a process that is always expensive at the commencement ; and that the after value that will accrue from it, will generally be according to the adaptation and selection of the ground to be planted. Hence it will appear that the capital invested will return a certain per centum, in accordance with the judicious selection of the ground, and making a proper choice of good kinds.

In order to give every facility to the selection of the most proper kinds of fruit, I have been more limited in my descriptive list than usual in such books. The object here kept in view has been to recommend none but those kinds that have been proved to possess such qualities as render them deserving a place in the fruit garden or orchard un-

der common culture : and here let it be understood that many kinds of superior qualities have not been described which require skilful culture ; for although their superior qualities demand for them every recommendation, it is under the care of the connoisseur and scientific gardener only, that they can be cultivated to any advantage.*

ART. 2. — *Location of the Fruit Garden or Orchard.*

The spot of land chosen for the fruit department will require to be sheltered from the north and north-west wind, which are always injurious to fruit plantations when in blossom. If it be so located as to lay a little descending to the southeast quarter the better, as in that situation it will receive the influence of the sun in the early part of the spring, so congenial in most cases to the growth and maturing of fruit. The nature of the soil should have the next consideration of the planter. A rich mellow loam, with a moderate dry, loamy sub-soil or bottom, with an even surface, that the water may not collect in the fall and spring and saturate the soil, will be found to answer most kinds of fruit. *There are yearly many thousands of fruit trees totally destroyed by being placed in a location where the trees are always saturated with water.*

The plot of ground being fixed upon, the next consideration is the preparing it for planting, which I consider a very important point, and deserving much

*To such persons as are about to make fruit plantations, it is recommended that their selections be made from respectable nurseries, and from those which are famed for superior kinds.

more attention than is generally bestowed on the subject.

ART. 3.—*Preparing the Ground.*

The preparing of ground for the plantations of fruit is so simple that it would appear to require little comment at this place ; but as the subject is generally but little attended to, it will be proper to throw out a few hints to the inexperienced planter.

In the first place the ground should be well worked a year or two previous to the planting, so that the earth is well pulverized in order to cling to the fibrous roots of the tree : for, if the soil is rough, adhesive, and not mellow, the fine fibrous roots cannot come into contact with the nutriment it contains, and so soon as the hot weather sets in, the earth dries, and finally the process of vegetation is greatly retarded and in many cases the trees die. Every attention should be paid to the cleansing of the land of all kinds of perennial weeds, as the dock, couch-grass and the like ; it should also be cleansed of any stones or other unnecessary rubbish ; a quantity of well rotted manure should be well worked and mixed with the soil, and every thing done to put the ground in the very best order one year previous to making the plantation.

ART. 4.—*On Planting Fruit Trees.*

Before I speak of the practice of planting, I shall make a few cursory remarks. The planting of fruit trees being for no other purpose than utility, it is necessary that every precaution should be used

to forward the intended purpose by the best means. I do not hesitate to say that many trees, and indeed sometimes whole plantations of fruit, are often totally spoiled by improper treatment when young. By due observation it will be seen, that trees have a great resemblance to animals in their infant state, namely, *in requiring proper nourishment to expand their proper functions, in order to form a strong, healthy subject at a future period.* And secondly, the planter will recollect that his object is to cultivate such fruits only as are of a good quality, which have mostly been obtained by a high state of cultivation, and can only be obtained in a healthy state by the best of culture.

Before I enter on the planting of fruit trees, it will be proper to say a few words on the selection of the trees, which I consider very essential, as those that are in a diseased or cankerous state when young, seldom grow and form into strong, healthy trees.

In the selection of trees the first thing to be attended to is to examine them well and choose those which have a clean, straight stem, and without any canker, wound, or other defect. The top should be of a regular expansion, and the branches equally dividing themselves so that an equilibrium is preserved from the crown of the stem in every part to the top of the tree. The roots should be regular and have a quantity of small fibres at the extremity of the leaders. And here let me remind the reader that every care in taking up the tree should be used, that those are not cut off, for the loss of them will greatly retard the growth of the tree the first year, as it will in such cases have to make

them anew before it can make any growth. When fibrous roots are cut off, the tree itself may be considered as merely a cutting, which must form its roots from the base before it can grow to any size and make the wonted efforts of vegetation designed by nature.

The planting of fruit requires more practical knowledge and particular attention than is generally apprehended by the inexperienced cultivator. From mismanagement in planting may be often traced, not only a lingering and unfruitful growth of the tree, but, in many cases, little effort in vegetation after planting and the certain death of the tree in a few years. This defect may sometimes be traced to planting too deep, which in my practice I have found a universal error in fruit trees planted in small city gardens, and other places, when it has been done by inexperienced hands. Planting too deep is more particularly exemplified in the apple, the cherry, and those kinds of trees whose roots naturally grow near the earth's surface. Deep planting brings such roots into a location where they cannot receive their wonted stimulants, as the influence of the sun and air ; and the food that is conveyed to them under such circumstances is in a crude, acrid state, and destitute of those fertilizing qualities it would acquire nearer the earth's surface. This consequence will always happen to trees planted too deep, as the cherry, apple, and indeed all kinds that do not strike roots from the main stem, as the willow, button-ball, and many kinds of forest trees, and shrubs, which, when planted too deep, lose their original roots, and replace them from the stem near the earth's surface. In contrariety to the above,

there is a frequent error in planting trees, which is, that their roots are planted too shallow, so that the drought affects their fibrous roots, and they cannot cling to and draw nutriment from the soil ; they are, therefore, eventually dried up, and the following season, the main roots have to produce new fibres to draw nutriment from the soil.

The *true* system for planting trees is to follow their natural depth and location as much as possible, which can easily be obtained by examining the depth and natural position of the roots before removal.

In the many authors I have perused, I have not read any satisfactory description of a method of planting fruit trees. They all agree that the hole intended for the tree should be dug larger than the circumference of its roots, in order to give it a free expansion without cramping in the hole, which is often the case in inexperienced hands. The next point agreed upon is the breaking up, mixing and pulverizing the bottom of the hole, so that the under tier of roots may strike freely, and quickly be established in the soil : after this preparation, the planting is recommended to be done, by placing the tree in the centre of the hole, filling it up about half way, and then gently shaking it upwards in order to draw the roots in their proper position, and treading close the fine earth to them. This method is not correct either in theory or practice ; for in most cases the roots must most certainly be forced out of their natural position, in the first place, by pressing the upper tier of roots to the bottom of the hole with the earth and treading, which should according to their natural position, be placed near the earth's surface ; in the second place, the roots are drawn up and

pressed *down* by the shaking the tree, and, instead of their laying in a regular expanded horizontal manner, if examined, will be found to be bent in an irregular manner : the over treading also displaces the roots, and the consequence is, that many of the best fibrous roots, being partly injured and out of their natural position, either die or have to make new roots from their leaders, in order to draw a proper nourishment to support the tree. Hence many fruit trees, after planting, remain for several years in an almost dormant state, when *fruit-buds* are formed instead of *wood-buds*, which, if allowed to flower and bear fruit, will dwarf the tree so that it never assumes the size and habit it would acquire if properly planted at first.

When a fruit tree is desired to form into a large handsome shape, every exertion should be used to encourage the growth into a strong luxuriant habit, and not to retard it in its infant state by allowing it to bear fruit, which always exhausts the sap that should feed the leaves, branches and like members of growth that are essential to form the habit of the tree. In the practice of planting fruit trees, the operator should make himself well acquainted with the natural growth and habit of both the roots and branches of the tree : for it will be found that different kinds of trees, have quite a contrary natural position of their roots ; for instance, as before stated, the cherry and apple tree roots are near the surface of the soil, whilst the pear perforates much deeper into the subsoil. All these positions should be carefully examined and understood before planting, for it is in vain to reverse the position of roots to any good purpose ; indeed when it is done it is an act

of violence imposed on nature and its ill effects will soon be discerned in the tree.

In the practice of planting, I recommend that the natural position of the root of the tree be examined, the hole dug wider than their circumference, the bottom of it well broken up, the tree placed in the centre, and the bottom tier of roots placed in an extended manner ; then apply some fine earth over them as a covering, being careful that no cavity is left under the *bole* of the tree ; after this layer of roots is properly placed and covered, then prepare to lay the upper tier in their natural expanded position, being careful not to cramp or bend them, but let their *fibres* be fully extended ; this done, fill up the hole with well pulverized earth a little above the surface, and rather highest near the stem in order to let off excessive moisture from the roots of the tree ; the surface may then be gently trod and the work is done. That the tree should be supported by stakes, and the ground kept in good order, are requisites too well known to require any comment, only that they should be attentively and strictly seen to at all times when needed.

ART. 5.—*On the Pruning and Formation of Fruit Trees.*

To form a tree properly it will require to be pruned and regulated when young, in order to bring it into a proper shape and fruitfulness. Supposing the tree to be two or three years old from the graft or bud, a head must be formed at the intended height by heading it down in the spring to two or three buds or eyes in each shoot that is near the crown when the young shoots begin to grow ; they may be

taken off to three or four in number of the strongest and healthiest, as they are intended to form the tree. During the summer the young shoots may be cleared of any filth or insects that may be detrimental to them. In the following spring the trees must be pruned in such a manner as to form a regular handsome head. It will be recollected that is the proper time to form a handsome tree, as each branch being formed from a common centre, draws sap in proportion to its luxuriance; and they afterwards form lateral or side shoots in proportion to their vigor; therefore it must be evident to any intelligent observer that the formation of a tree in its infant state is of the greatest importance.

It will be often seen that one shoot is much more luxuriant than another, which is owing to its being of a more succulent nature, and consequently draws a greater portion of sap: by heading down those shoots to three or four eyes in the spring the luxuriance will be divided into so many parts, and bring it on a balance with the other parts of the tree. This method may be continued for two or three years, when the habit or shape of the tree will be seen. The *port* or *habit* of fruit trees should be considered; as the laws of nature are not easily reversed to any advantage, consequently they should be as much as possible cherished, for by practical observation (which is always the best guide to perfection,) it will be seen that some trees grow in a pyramidal form, some weeping, others conical, and some form a regular head of an even circumference at the bottom, and tapering on the top in the form of a *dome*. The first of these habits, the *pyramid*, is beautifully exemplified in the young trees of the button-ball

and some varieties of the cherry ; the second, the weeping, in the weeping willow and the native American elm ; the third, forming the shape of a dome, is generally represented in most kind of apple trees, and the *conical* is often beautifully represented in the cherry and many kinds of pears when young. To this kind of port or habit of trees there are many exceptions or at least variations, which never fail to happen as the trees are far advanced in years ; for although all these different habits will appear in trees when in their youth or healthy state of growth, old age will deform them a limb at a time until their symmetry is entirely lost.

In the act of pruning, the first thing to be attended to, is the port or habit of the tree, which should in all cases be kept in its natural order by pruning it in such a manner as to encourage the most healthy parts of the tree. The next thing to be attended to, is in procuring proper tools for the purpose, which should be of the best quality.

In pruning trees, it should be recollected that all shoots which are amputated from the tree whilst young, heal their wounds better than when old, and that the shoots should be so taken off, as to leave the wound on the tree in a sloping manner downwards, to let off the water freely. Water settling on the wounds of trees, often saturates and decays them, and also the trunk of the tree.

ART. 6.—*On Thinning and Regulating Fruit.*

Much might be said on the subject of thinning fruit ; indeed, in some cases, it may be said to be

one of the principal requisites in horticulture, though almost universally neglected.

Before I proceed to the method of thinning fruit, I beg leave to state that my object is to consider the subject in reference to its most extensive branch, namely, *the thinning of all kinds of fruit on trees, vines, &c.* I must direct the reader to that best criterion of horticulture, the natural properties of trees and vegetables. By due observation it will be seen that fruit, as cherries, plums, pears and apples, are generally the best in flavor when the crop is thin ; and the crop in the following season in such cases is pretty certain, if it is not injured by the blight and other local causes. On the contrary, when trees are thickly loaded, the fruit is not so good in quality and flavor, and the crop in the succeeding year is very uncertain ; the latter case is often exemplified in trees which bear alternately every other year. I think no person will deny the correctness of the above assertions, nor, that it can be in a measure obviated by the thinning and regulating of fruit. Practical gardeners well know that peach trees, grape vines, and all kinds of fruit trees forced under glass, bear regular crops of fruit without intermission for many years, and that such trees and vines are always thinned of such fruit as is considered superfluous. Instances might be quoted where fruit grows almost natural, which is destitute of that richness of flavor it would acquire if the tree had been thinned. I do not recollect of seeing the plum bear so free and thrive so well at any place as at Albany, New York, which place appears to be quite congenial to this fruit ; the gages, magnum bonum, and all the finer varieties, are found there in abundance. But I

cannot say that the flavor was so rich as might be expected, which I think is partly owing to the trees being heavily loaded every other year.

To give any precise rule for the thinning of fruit would far exceed my prescribed limits, and indeed it would be rather a difficult task ; therefore I shall endeavor to hit upon some medium which shall be satisfactory and clear.

Vegetables and trees, like animals, have their different stages of life, as youth, maturity, old age, and decay ; this must be considered in thinning of fruit. Young trees will be found most capable of maturing a heavy crop of fruit ; and generally it is seen that they have the most moderate produce. Old trees, on the contrary, are the least capable of maturing a heavy crop, which they mostly bear :—hence it would appear that young trees do not require so much thinning as those in years : but in most cases they should be attended to. It may here be observed that where young trees are in a luxuriant state, all the fruit should be allowed to remain on the tree in order to reduce it to a proper state ; and that very old trees should be thinned of their fruit in proportion to the strength of the tree, which is generally feeble.

Young trees often bear fruit the first year of planting, in consequence of their being checked in growth by removal ; but in this case the fruit should always be taken off, or the tree will be much exhausted and retarded in its growth at a time when it should have every effort afforded to nourish and cause it to strike root and establish itself in a healthy manner.

CHAPTER II.

ON THE CULTURE AND MANAGEMENT OF BERRIES.

ART. 1.—*General Remarks.*

THE currant, raspberry, strawberry and gooseberry, are examples of the most useful kind of berries. A berry may be defined as a pulpy substance, containing small stones or seed ; and ripening with a pleasant acid taste, and in most cases, when in a wild state, serves as food for birds : when highly cultivated it is mostly valuable for the dessert, and is used in domestic cookery in many ways hereafter described under the different heads.

ART. 2.—*On the Culture of the Strawberry.*

Its origin and useful properties.—The strawberry derives its English name from the custom originally followed of putting straw under the plants when in fruit, to protect it from being spoiled by the ground, which rot it in moist weather.

The botanical name *Fragaria*, is given from the fragrance of the fruit, which is said to sweeten the breath, remove the tartarous substance from the teeth, and is classed by physicians among their pleasant remedies. In domestic concerns it is used in many ways when ripe ; it forms a delicious dessert—is used with cream, and preserved in many different ways.

Native country and varieties.—The species of the strawberry are numerous and its varieties are

unlimited, which are natives of North America, Chili, Hudson's Bay, England, and the Alps. Many species are designated from their primitive country or place of growth.

Soil and location.—The soil best adapted to the strawberry is a rich, mellow loam, and if a portion of sand the better. The location should be that of a tolerably moist place, well exposed to the south and protected on the north quarter.

Mode of propagation and culture.—The new varieties of strawberries are obtained from seed of the choice kinds, which may be sown in boxes or pots filled with light rich earth in the fall ; the seed must be sown very shallow and lightly covered ; the boxes should be placed where they are partly protected in the winter from its severity ; and early in the spring they may be placed in a frame or other place, to start the seed into growth early.

When the plants are grown into three or four leaves they should be pricked out into a nursery bed, in a cool, moist situation, partly shaded ; and in the fall they may be planted out into a final bed for fruiting, as directed for general culture. The method of propagating the strawberry is from the runners of the mother plant in the fall. This may be greatly facilitated, by covering the earliest plants from the vines with a little fine, light, rich earth, and giving occasional waterings, in order to make the young plants root freely. By this method the plants will be much stronger for planting and withstand the winter's severity better ; being more strongly rooted in the ground, they will not be so liable to be drawn out by the frost.

Planting the bed.—Previous to planting, the

ground should be well cleansed of any perennial roots, as couch-grass, dock, &c. ; it may then be well manured with rotted dung and dug a spade deep, raked off even, and shallow drills drawn eighteen inches apart, leaving an alley of two or two and a half feet between every three rows, for the parting of the beds. Having the ground prepared, the plants may be then taken up and dressed by taking from them any dead leaves, and shortening the roots with a sharp knife. The plants should be dibbled in the rows from twelve to fifteen inches apart, and a gentle watering given immediately after planting. This work should, if possible, be performed of an evening after a shower of rain, as the plants will then strike root freely. The culture of the strawberry is simply to keep the ground clear, by hoeing, raking, &c. in spring and summer.

After the strawberry has flowered and the fruit begins to swell, if the ground is very dry, the bed should have two or three good waterings in order to swell the fruit in good perfection. The cause of strawberries bearing light crops of fruit is more owing to drought than any thing else I am acquainted with.

Ripening the fruit.—When the fruit begins to change its color, some short grass or straw may be laid under the vines in order to keep the fruit from rotting on the ground, which is often the case, especially in wet seasons. When the fruit is all picked and the plants have put out their stoles or runners, the beds may then be dressed of their weeds and any litter, by cutting off all the runners close to the stool, hoeing up the weeds, and raking off all the rubbish neatly between the rows.

Winter management.—The strawberry requires to be slightly covered, during the winter, to protect it from the winter's severity.

The following paragraph is from the Cultivator, and the best article I have seen on the manuring the strawberry. "With regard to the manures for strawberry beds," says the Editor, "such are to be preferred as are cool, and from the seed of weeds. Cow manure is preferable to that of horses. Bone dust and horn shavings are excellent, if not applied in too large large quantities. A bushel and a half of either should go as far as a load of long dung. For top-dressing the beds in autumn there is nothing better than tan, that from the morocco leather being preferable. The tan smothers weeds, keeps the soil moist, the berries clean, and seems withal to afford the specific food of the plant. It is recommended to cover strawberry beds lightly with straw, in the spring, and burn it off, which destroys the seed of weeds, &c. We have been cruelly censured for this recommendation, by one who unwittingly burnt *piles* of straw upon his beds, and consequently destroyed his plants."

ART. 3.—On the Culture of the Raspberry.

Origin of its name and useful qualities.—The raspberry derived its English name from the appearance of the fruit to a rasp or file—its botanical name *Rubus*.

The raspberry is eaten as a dessert when ripe, and in cookery as tarts ; it is preserved in jams and jel-

lies, and a very pleasant wine is made from the ripe fruit.*

The raspberry is a native of Great Britain and many parts of Europe, and North America. Its varieties are numerous. They have been much improved by raising seedlings by cross impregnating with superior kinds.

The raspberry may be raised from seed in precisely the same manner as the strawberry, and planted in a fruiting bed in the usual manner.

Culture and Management.—The raspberry requires a deep rich soil to grow it to perfection; and should be planted in beds in such a manner that one plant partially shades another from the burning rays of the sun.

The method of propagation is in the first instance to obtain new varieties from seed, which should be sown in the fall in long narrow boxes of light rich earth; when the plants come up in the spring they should be well watered in order to throw them into a healthy luxuriant growth. About the middle of June a nursery bed may be prepared to receive the young plants. A piece of rich ground may be selected for the purpose in a situation where it is partly protected from the sun's influence, but not too much shaded. Prepare the ground by giving a coat of good well rotted manure, dig and well pulverize and mix it together, rake it level, and dibble the young plants in rows one foot apart and six inches

* A very superior variety of the red raspberry has been raised from seed by Mr Mason Gardner at Charlestown, Massachusetts—which he has given the name of "the grape raspberry," from the appearance of the fruit to a bunch of grapes.

between in the row ;—the ground should be well worked in the summer season and everything done to encourage the growth of the young plants, and in the spring they may be planted out into a fruiting bed as recommended below. A moist time should be chosen for the transplanting of the seedling ; it is better to defer it after the time stated than to plant when the weather is very dry.

The general method in cultivating the raspberry is to prepare a piece of ground in the spring, and plant out young plants of the last year's growth in rows four feet apart each way : in the fall the old dead wood is cut away and the young shoots are laid down and covered over with earth about three or four inches deep to guard them from the severe frost a short time before the close of winter ; when the spring opens the shoots are taken up and neatly tied to stakes. The ground is well worked between the rows in the summer, and in the fall the old wood is cut out and the young laid down as before. An improved method of propagating the raspberry is by taking up the young plants between the rows, early in the spring that grow from the roots and planting them in a nursery bed. The method I could recommend is to prepare a rich piece of ground by digging it and raking it smooth, when the young plants may be taken up and planted in rows one foot apart with a dibble and six inches in the row ; the ground will require to be well worked between the rows during the summer season, and in the fall or spring they may be planted out into the fruiting bed, as before directed.

ART. 4.—On the Culture of the Currant.

The currant is a native of Great Britain, many parts of Europe, and North America. Its species are few, and the varieties are not numerous. The fruit is considered extremely wholesome, and is eaten as a dessert; it is used in domestic cookery in almost every way in which fruit can be applied. From it are made excellent jams and jellies, which are much esteemed in sickness, especially the black currant. It also makes an excellent wine and vinegar. It is, indeed, one of those kinds of domestic fruits that should find a place everywhere.

Propagation and Culture.—The currant is increased in varieties from seed, in the same manner as the strawberry and raspberry, but it is not worth while to undertake to improve the currant by seed; for it may be asserted, I think with every confidence, that the red and white Dutch varieties, which have stood the test of nearly two centuries, have every property that can ever be expected to be found to centre in this valuable fruit.

The best and most general method to propagate the currant is from cuttings of the young wood in the spring. The cuttings may be prepared by cutting them to about one foot in length, and taking out three or four of the lower eyes or buds, in order to prevent them from throwing out suckers from the root, and to form a clear stem. The cuttings being prepared, a piece of ground, lying in a northern aspect, of a rich loamy nature, may then be prepared, by digging and well pulverizing the ground, raking it level, &c.; this being done, the cuttings may be inserted in the soil by a line stretched across the bed.

This may be performed by pressing the cutting into the ground by the line from four to six inches, and from four to six inches apart in the rows ; this done, the earth may be closed to the cuttings by the heel ; the ground may then be neatly raked next to the row, and the work is done. The line may then be moved from a foot to fifteen inches for another row, and so continue until the whole is planted. The ground should be kept clear between the plants the first season, and if they are not wanted to be planted out the next year, in the spring they may be headed down to one eye in each shoot, and some rotten manure put between the rows and dug in neatly ; they will then be in fine order for planting the next year.

The best and most general method of cultivating the currant is to prepare a rich piece of ground, by manuring, digging, &c., and planting out the young plants from three and a half to four feet square each way, or, where large plantations are to be made, perhaps five feet between the row and three feet in the row would answer a better purpose, as in that case, a sufficient space would be allowed for a horse to work between them.

The culture of the currant is simply to keep the ground clean and in good order by manuring, dressing, &c. The manner of pruning the currant is, to form a tree into four or five leading shoots, and prune in all the small wood every spring, to two or three eyes of the main shoots, leaving a leading shoot of young wood at the end of each main leader, of about five or six eyes. In order to keep the tree in a healthy, vigorous state, it is a good method to train up a young healthy shoot every year, and cut away an old one in such a manner, that the frame

and form of the tree is not disfigured. By this method a continual succession of young wood is kept up for many years. The currant is often trained to good advantage to trellisses or fences.

ART. 5.—*On the Culture of the Gooseberry.*

The gooseberry is a native of the same parts of the world as the currant ; but its species are more numerous, and its varieties unlimited and yearly increasing from seeds of the finer kinds.

The gooseberry is a prominent article in domestic cookery ; when green it is used as a tart, and preserved for that purpose in this state in bottles.

When ripe it is used for the dessert, for pies, puddings, &c. ; it is also preserved in this state as jams and jellies ; and we have the testimony of Dorothy, the domestic consort of the " Vicar of Wakefield," that the gooseberry, when ripe, makes an excellent wine, to which use it is often put in Great Britain.

The new varieties of the gooseberry are obtained from seed in the same manner as the raspberry and currant. The manner of propagation is by cuttings, in the same way as the currant, and the mode of preparing and planting the ground precisely the same ; but the selection should be made in a low, moist, loamy spot of ground, or the gooseberry will seldom thrive well ; while the currant will thrive in almost any soil and location.

Pruning.—The gooseberry tree should be well pruned every spring, so that the air may have free access to every part of it, in order that the fruit may swell freely and evade the mildew with which it is

generally affected more or less in this country. The method of pruning is the same as that employed on the currant, with the exception that the young leading shoots of the main branch should never be shortened, but be allowed to remain at their full length.

To facilitate the growth of this desirable fruit, seedlings should be raised from varieties of the country, which would most probably produce kinds of a superior quality that would escape the mildew, as it is seldom that the native varieties growing in the different parts of the Union are affected with that disease. Such kinds would probably produce fruit earlier and of better flavor being natural to the climate. I hope to see a trial made of this fruit by some of our enterprising fruit growers ; the experiment is certainly worth trying.

In the many different modes I have seen practised in the culture of the gooseberry, I have seen none that has answered a better purpose than the growing of the trees in a very rich soil, and so situated that they have been in the time of swelling the berries partly shaded from the influence of the sun. This I have seen done to great advantage by planting the trees in the centre of four feet asparagus beds ; in such places the roots and branches are in a location where the heat and moisture is uniform, which is a grand point in the culture of the gooseberry, for when fully exposed the sun scalds the rinds of the fruit, and there can be little doubt that sudden changes from drought to moisture bring on the mildew and other diseases.

CHAPTER III.

CULTURE OF STONE FRUIT.

ART. 1.—*On the Culture of the Plum.*

Its native country and varieties.—The plum is a native of Great Britain, many parts of Europe, and North America. Its species are numerous and varieties undetermined. It is used in many ways in domestic cookery, as pies, puddings, tarts, &c., when ripe, and many varieties (the green gage particularly), are often used when green in tarts; the plum also is one of the best desserts of the season. It is preserved by drying the fruit, when ripe, in an oven or the sun, and preserved with sugar in the usual way.

The culture of the plum has been, hitherto, very uncertain and precarious in most places; and, in many instances, been abandoned, under the idea that it “cannot be cultivated,” owing to local causes entirely discordant, either with the theory or practice, of those who know anything relating to the culture of the plum tree. Some assert it will not flourish on the sea-shore, and others, to the contrary, that it will not flourish in inland places. Heat, cold, dry seasons, and the like, have been considered as injurious to the well being of the plum. For my own part, I do not think that either of these causes is the true reason of its failure; and I have had very many just reasons to believe that the plum will flourish in almost any district of the United States, *provided a proper location be chosen for it.* In Albany, and

many places on the North River, the plum has done admirably well many years ; in Charlestown, Mass., fine specimens of the White Gage, Bolmar's Washington, &c., have been exhibited by Mr Johnson for several years ; and in Cambridgeport, near Boston, Mr Pond's plum garden has long been celebrated, and last year, 1838, his show was particularly fine. Newark, N. J., and many other places, might be quoted in the same manner. In Europe the same inference may be drawn as to locality.

*The plum never does well only when grown in its peculiar soil, and in that case it seldom fails, in a warm or moderate climate :—*The location best adapted to the plum, is that of a low moist place, where there is a depth of rich black earth, and where the roots can always be in a moist situation. In such places the plum tree makes rapid growth for two or three years after planting, and then commences a bearing state, which continues for some years. On this soil, and gravelly or sandy bottom, the tree when planted makes feeble growth, and forms fruiting buds, or spurs, on almost all its branches, which bear numbers of fruit, that either drop off when small or ripen with a bad flavor ; the tree is affected with knobby protuberances, containing a worm called the *curculio*, which is created more by the poverty of the tree than anything else ; the fruit, too, often swells, without forming the stone, into an ill formed yellow fruit, and drops off when in a growing state. The main cause of these, is owing to *the roots of the tree being in a situation too dry* ; and the flow of sap not being sufficient for the nature of the tree.

I shall not go through the routine of the propaga-

tion of this tree, as it is precisely the same as the cherry, with the exception of a different soil as stated above. But let me here caution the reader against the very improper method often practised of inoculating the plum into peach stocks. This method produces fine young trees, that seldora or never bear fruit. With this precaution, I shall proceed to give a few hints relative to the culture of the plum.

The plum I consider a domestic tree. By this I mean that it will thrive around dwellings either in town or country. It will flourish well, if planted near where the sediments of soap suds, &c. are continually running or accumulating. Trees planted near heaps of stones, or pavements, where the soil is good underneath, will flourish and bear well. Reclaimed land near rivers, or on the seaboard, or where places have been filled up several feet with rich earth and manure, are locations well adapted to its growth. If such locations are a little sheltered the better, for being much exposed to the sun I do not think is of any advantage to its growth. In the culture of the plum a very false system is often adopted : that of heading in the luxuriant shoots of the young wood of young trees, when they are growing in a suitable location. This shortening is done with a view to throw the tree into a bearing state, when the only thing effected by the method is, that a number of shoots are thrown out, and the tree forms a thick bushy top of small weak branches, and never makes so large and handsome a tree as it would if it had been left to nature. Plum trees should never be pruned when growing as standards, only when the wood is too thick and then the weakest wood should be cut out.

ART. 2.—*On the Culture of the Cherry.*

The cherry is a native of Great Britain, France, most parts of Europe, and America. The species are few, and varieties are not so numerous as the apple, pear and many kinds of fruit.

The cherry is used as a dessert when ripe, and considered wholesome ; it is used in many ways in domestic cookery, and when ripe makes a very pleasant wine.

New varieties of the cherry are obtained from seed in the same manner as other fruit. The method of propagation is by raising young plants from seed and planting them in nursery rows, and grafting or inoculating them as directed in the nursery.

The cherry will thrive in more varieties of location and soil than almost any other kind of fruit ; a dry, mellow, loamy soil, with a tolerably dry subsoil, on a side bank is the best adapted, and will be found to answer the best purpose for its growth. In many cases the cherry will answer an excellent purpose as an ornamental tree at the side entrances of a dwelling house, and in some instances I have seen avenues formed of the upright growing kinds which have had a very pretty effect, besides producing abundant crops of fruit.

The wood of the cherry tree is used for an excellent purpose by the cabinet maker in manufacturing articles of domestic furniture, as tables, chairs, and several articles of ornament ; and its fruit may be said to be of the first order for domestic purposes.

There are few kinds of eatable fruits which have

retained their different varieties so long and uniform as the cherry, and in which a few varieties will serve to answer every purpose in domestic cookery, and please almost every palate as a dessert. The different varieties of the Tartarian, which undoubtedly originated in and received their name from Tartary, can be dated back two centuries, and the same may be said of the Kentish red cherry and many kinds of the "heart" which probably received their first name from their original locality and the form of the fruit.

ART. 3.—*On the Culture of the Peach.*

The Peach is a native of Persia, France and other temperate climates, and in many parts of the United States. Wildings spring up from seed and produce tolerable good fruit in propitious seasons. Indeed there are few kinds of fruit which produce better from the wildings than the peach, and hence many trees are planted and never worked with the superior kinds, which however, is a system not to be recommended, for the trouble is trifling, and the time lost in the growth not above a year at the most ; consequently good varieties of known qualities may be propagated and grown to the very best advantage.

The peach is a fruit of the first order for the dessert, and is used many ways in domestic cookery, as tarts or preserves, and in the southern states is used with milk in its raw state after being skinned and quartered. The species are numerous and varieties undetermined and new varieties of acknowledged merit are daily adding to the list of long standing qualities of imported kinds.

The culture of the peach is generally of an easy nature, and the product when the seasons are favorable is encouraging, in most parts, although in the more northern states the trees are often very much injured by the winter's severity, for which no remedy to my knowledge can be applied in any satisfactory manner. In the vicinity of Albany, N. Y. I have seen peach trees laid down and covered with soil as the grape vine, but the system has rarely answered a good purpose, for in bending down the tree the roots have to be loosened on one side ; and besides I have noticed generally that the blossom buds are lost when the branches are taken up, so the practice fails altogether of its object.

The peach is at first propagated by procuring the stones and keeping them in a mould during the winter in a box or other vessel, and in the spring they may be sown in rows thickly together in a rich soil ; when the plants are grown three or four inches high, they are then to be replanted into nursery rows two feet apart, and one foot between in the row ; this removal must be made in moist weather or the plants will not root freely in the soil.

In the operation of pruning, care must be taken to cut the branches off clean, and shave the rind with a sharp knife in order that it may heal freely. All dead wood and small, weakly branches may be cut out, and the tree regulated in such a manner as to have an equal proportion of wood. There is no tree that naturally divides itself into a more regular habit than the peach, but it is generally seen to grow too much at top, and consequently the branches are much diminished in the centre. This is to be counteracted by pruning the top spike of the leading

branches back to a side shoot, which will give more succor to the centre of the tree.

Where strong, luxuriant shoots of one year old are seen growing from the centre of the tree, or when any shoot has been broken off, they may be pruned, as they rob the smaller fruit bearing branches of their proper nutriment.

Summer Pruning.—The peach, like all other trees, requires some attention in the summer as to regulating any superfluous branches that may appear, and destroying insects. If it so happens, which is very seldom the case, that too great a quantity of fruit sets and swells, it may be thinned to give that which is left on the tree a better size and flavor.

CHAPTER IV.

CULTURE OF POMIFEROUS FRUITS.

ART. 1.—*On the Culture of the Apple.*

THE apple may be considered the staple fruit of America ; and its well known properties in domestic uses render anything that can here be said in recommendation, entirely useless. The wild apple or crab, is found growing spontaneously in most parts of North America and Europe, and we have varieties from Siberia, called the Siberian crab, which is more grown as an ornament than for any useful purpose. There are several species of the apple, and the varieties are numerous and undetermined, which

are yearly increasing by seedlings, some of which are procured by culture, and others are the accidental sports of nature. The latter of these are the most rare, but long experience has abundantly proved that many of the very best kinds of fruit have been procured from "*wildings*," or accidental sports of superior kinds from the crab. Indeed it may pretty safely be asserted that the types of most of the best kinds of fruit now extant, have been at first originated from this sporting of the primitive to a superior kind.

The apple is so generally cultivated, and its usefulness rendering it eligible almost everywhere, there is not that due attention paid to its selection and culture, that it merits. The apple is strictly speaking very local in its nature, by which I mean different varieties thrive and produce much better in some districts than in others; this fact although clearly evident and undisputed by any person that has travelled through different countries and districts, where the apple flourishes and is grown in large quantities, has never to my knowledge attracted the attention of pomological and horticultural writers sufficiently to induce any one to compile a treatise on fruit, which shall point out the origin and particular districts in which many valuable fruits can be grown to perfection, in a manner that would ensure those who planted, a certain and sure revenue from their product. A work of this kind, written by a careful observer, acquainted with the nature and culture of fruits adapted to this country, could not fail of being well received; and the author would be doing a public service much wanted. That the apple is local in its productiveness, we have ample

proof from the different kinds finding their way to market as a matter of profit, in various parts of the State. Hence the Baldwin and Roxbury russet are found in abundance in the Boston market in the fall, and are an important article of exportation from that port to South America and the West Indies, besides furnishing the winter stock for every family in its vicinity. These varieties flourish about fifty miles parallel to the seaboard of Boston, when they cease to be plentiful. Most likely both first originated from the primitive fruit in the neighborhood of Boston. The New York Russet, Greening, &c., bear the same testimony in growth and appearance in the market; the cider for which Newark, in the Jerseys, is so famous, is made from two kinds of cider apples, the Harrison and Campfield, which no doubt are natives and congenial to the soil peculiar to that part, as they flourish only to perfection about thirty miles on the border and parallel with the river Passaic.

The same peculiarity also prevails with the different kinds of apples in Great Britain; for in the London markets are to be seen the different kinds that are the most productive in the different parts, as for instance the old variety of Nonpareil, so celebrated as a table fruit of the first order, is mostly grown in the county of Kent; as is the Loane Pearmain, the Lemon Pippin, and many other kinds that are a principal item in the markets. Now when these kinds are grown in any other parts of England, they do not give such yearly produce, and when transplanted hither, it is seldom seen that they give any fruit; and the trees do not flourish well, which is simply owing to their being out of their natural cli-

mate and location. The same thing happens with the choice kinds of American apples when transported to Great Britain ; they seldom do well, nor can it be expected. The same local nature also exists in the pear, the plum, and most fruits in a certain degree, although in some cases the reverse is seen ; for the green gage plum flourishes in France, Great Britain, and in most parts of the Northern States. The red and white Dutch currant, are natives of Holland, and have been known for two hundred years. They flourish in all parts of the Northern States, Great Britain, &c. alike, and give fine fruit, and have no appearance of being run out or depreciating in their quality, whilst many fruits we find are local to a certain district.

There are two methods which may be adopted in the culture of the apple to advantage. One, the most general, is that of cultivating for the orchard, which requires a system of forming the tree, when young, in a strong luxuriant manner, in order that when fully grown the tree may fill a large space, and under this process we may strictly rank orcharding. The other method, is that of dwarfing trees into a low habit, so that the trees may be with propriety introduced into the garden and give a produce so that an under crop may be certain, or at least that they may not occupy but a very small space of ground. Now as each of these methods must be so managed, that the trees are in a healthy state, there appears to be some art or knowledge required to manage the thing with propriety. And here we find another desideratum in the culture of fruit, which at some future time will perhaps employ the pens of distinguished writers on pomology, namely,

a definite rule which shall explain the characteristics of certain varieties of fruit trees, to be worked for the purpose of giving a different stature to any variety when inoculated or ingrafted on the wilding or crab. That this is satisfactorily known by many who have devoted their time and talents to the culture of fruit, I have no reason to doubt ; but I have seen nothing communicated to the world through the press to any extent on the subject.

ART. 2.—*On the Culture of the Pear.*

The pear tree is found growing spontaneously in Great Britain, France, Flanders, and most parts of Northern Europe and America. Its species are numerous and varieties undetermined, which have been highly improved by the energetic and long experimental perseverance of scientific pomologists of different countries, among whom Van Mons of Belgium, and Knight of Great Britain, have been very conspicuous. The results of their experiment have put the world in possession of many fine varieties of this fruit which never would have made their appearance without such experiments reduced to practice under the most scientific principles. To this may be added many fine varieties which have originated from an accidental birth or sport of nature of which the Chaumontelle and the St. Germaine are of the most ancient date. The Seckel, Cushing, Preble, Lewis, and many others, are proved to be the accidental births of this country ; and the same remark might be made of pears which are indigenous either by accidental birth or pomological exper-

iment in every part of the world ; they are generally found to be natives or wildings.

The pear forms a conspicuous item in the dessert, and is admired for its rich juicy qualities more as a table fruit than for domestic cookery, although the autumnal and winter kinds are used for stews, pies and other domestic purposes.

Soil and location.—The soil best adapted to the pear is a deep rich mellow loam, approaching to that of clay. If the pear tree is planted in a soil where the surface earth is thin and the subsoil of a barren sand or gravelly nature, it rarely grows to any perfection for many years together ; for the roots generally strike deep for their support and draw moisture during the summer from the subsoil, and consequently on poor gravelly bottoms the roots cannot extract their wonted nutriment of hot dry summers, and hence the fruit does not come to its maturity, more owing to poverty than anything else. An instance of this may be drawn from the fact that many fine varieties of pears bear good specimens of fruit in the vicinity of Albany, owing to the subsoil being a cool moist clayey bottom, that do not bear well in New York and in the New England States.

The location should be chosen in a sheltered place, for in a too much exposed situation it is rare that pear trees, the tender kinds in particular, bear good crops of fruit.

The method of propagation is by raising stocks from seeds in the nursery as directed under the proper head. The pear is sometimes worked on the quince and white thorn when it is desired to have the tree of a dwarf low stature to train against fences or trellis, or indeed for any purpose when re-

quired to be of a dwarf habit and brought into a fruiting state in a short period after planting.

ART. 3.—*On the Culture of the Quince.*

The quince is an esteemed fruit as a preserve and to mix with the apple, in tarts and pies. There are many varieties, but few seem to flourish well for many years together, owing to local causes injurious to the tree, as the severe winters, or fire blast by which a great part of the tree is struck in the summer, causing the leaves to turn red and die.

The quince is propagated generally from the suckers which are thrown out from the roots. It is also propagated by cuttings in the same manner as the currant, and in many cases it is made use of as a stock to work the pear on, to bring it into a dwarf habit for the purpose of planting in confined places, as the borders of small gardens and for training on trellis.

The best location for the quince is a rich low place where it is continually moist ; and hence it is that it generally flourishes well by the sides of drains and on the flat margins of running waters ; a good loamy subsoil is also of great importance to the quince, for I have generally found it to flourish best on such bottoms.

The planting and raising the quince, to a fruiting tree, is attended with the same care and management as other fruit ; although I am of opinion that when in a fruiting state, it is rarely that the tree has due justice done to it.

The quince is a tree that requires an annual pruning more than any other fruit tree that I am acquaint-

ed with ; for like the Morello cherry, it fruits from the last year's young wood principally. It is therefore important that the young wood should be strong and healthy in order that the fruit set free and swell to a good size. To obtain this, the tree must be annually pruned twice a year, in the summer and in the spring. The summer pruning may be done when the fruit is about swollen to half its size. This is simply to cut out any decayed wood and the suckers from the stem that weaken the strength of the tree ; any weak young wood which enfeebles the fruiting branches, may also be cut away.

The spring pruning I recommend to be done about the time the buds are beginning to expand ; in this pruning all the dead wood is to be cut out, and the thin slender shoots. The fruiting shoots which are of the last year's growth are then to be chosen and to be left regularly over the tree a convenient distance, say fifteen or eighteen inches apart, when the remainder of the young wood is pruned off in every part of the tree.

ART. 4.—*On the General Culture of Fruit.*

After what has been said of the culture of fruit trees under the different heads of the nursery planting, and the separate divisions of the different natural families of fruit, little remains to be spoken of here, nor would it be excusable to again tax the reader's patience by reiterating a tautological explanation of the different modes of practice recommended to be followed ; although perhaps a few comments on the general outline of culture may not be unacceptable to the inquiring practitioner. Leaving then the modes of *propagation, planting, pru-*

ning, and like operations, to be perused under their proper heads, I shall confine this subject entirely to the management of the ground of a fruit garden or orchard after being planted the first year.

It is most generally the custom to crop the ground between fruit trees for three or four years with potatoes or different kinds of vegetables ; to this system there can be no objection if it is not over done ; but where young orchards or fruit plantations are over cropped so that the ground cannot be well cultivated between the rows, and the produce is taken off in such quantities as to exhaust the soil, the growth of the trees is very much retarded and impoverished. The under crop of orchards or fruit gardens should always be considered as a secondary consideration ; and if the produce will merely pay for the labor, the cultivator ought to be contented.

In the first spring of a new planted orchard or fruit garden, I recommend, if the ground has not been manured before planting, that it have a good manuring and be well ploughed or dug deep ; and cropped with potatoes in rows two or three feet apart, leaving a breadth of four feet by the rows of trees uncropped. Every care should be taken to cultivate the ground in the very best manner during the summer between the crops, and the part left by the trees should be kept clear of weeds and worked deep with a *fork hoe* or some tool, in order to prepare the ground so that the roots of the trees strike freely into it.

In the fall when the crop is taken off, the ground should be ploughed towards the tree, beginning close to the stems with a shallow furrow so as not to disturb

the roots of the trees—the next furrow may be ploughed deeper, and the centre part as deep as possibly can be done. This ploughing should be so managed that the ground lays rather highest near the trees, and the last furrow, which should be in the centre between them, forms a drain to take off the surface water in the spring.

In the following spring the ground may again be manured and ploughed or dug as before directed.

As the trees increase in size and the roots send out their small fibres, the earth should not be worked so deep as to interrupt their expansion and progress, but the surface about the stem of the tree should be merely hoed and kept clean, and the ground in the middle of the rows worked deeper until the whole of the soil is *threaded* over with roots; which will be in a few years. It is much to be doubted if a system of working deep among fruit trees is correct after the first years of planting; because their roots are interrupted and cut off in their progress; and it is a truth which admits not a moment's question, *that the roots of trees require to extend themselves as the top makes a progress in growth, to support and nourish the tree.*

I recommend that a quantity of compost as directed under its proper head be spread over the ground every other year, and the land if cultivated be kept clean by hoeing, raking and like culture, but not dug or ploughed deep when the ground is rooted over.

CHAPTER V.

CULTURE OF THE GRAPE.

ART. 1.—*Remarks on the Culture of the Vine.*

IN my remarks on the culture of the grape, I shall principally confine the subject to the *ill effects of bad management*, in order to throw some light on a more correct method of culture. In the first place, the grape vine is subject to many casual injuries when in a growing state, owing chiefly to the very porous nature of the wood and leaves, which render it susceptible to the mildew, red spider, &c., by which many crops of fruit are totally lost. Whatever food, impurity of air, or epidemical disease is present to the grape vine, it is readily imbibed by it, and the vine either flourishes or sickens, according to the presence of such food or disease. The roots also quickly convey any matter in a liquid state to the branches and most minute part of the vine; hence the vine has often been resorted to by phytologists to investigate the circulation of sap, which has given rise to many useful facts, by charging the sap-vessels of the wood with colored fluids, which have been traced through the different channels, to the leaves and most minute parts.

The mismanagement of the grape vine may be frequently traced to the neglect of summer pruning, particularly in city gardens, where it generally is cultivated on arbors or trellis; for when the vine is allowed to grow without any restraint, or summer pruning, it seldom brings its fruit to any perfection,

nor grows in a healthy, vigorous manner. This defect is chiefly owing to the wood growing too thickly together ; the consequence is, that it is of a soft sappy nature, and not in a proper state either to bear fruit the following year, or hardy enough to bear the severity of winter. This fact may be easily ascertained by an intelligent person who will take the pains to examine vines in the fall, so treated ; the young wood will be found of a soft sappy nature, when it should be hard, to ensure fruit the following season. Vines which have not been summer pruned, are generally so thick of young wood that the *sun* and *air* are partly excluded from the under branches, which are, consequently, weak, the fruit small and of an inferior quality, with many of the berries rotting from the bunches, owing to their being too much shaded. If the vines are allowed to remain thus, the fruit will not ripen, and therefore it will not obtain its proper quality, consequently it will be unpleasant to the taste and unwholesome.

ART. 2.—*Soil and Location.*

The soil best adapted to the grape vine, is that of a rich loamy nature, with a portion of sand ; but almost any natural soil will grow the native grape, if richly manured, on condition that the subsoil is dry. Wet bottoms are in all cases injurious to the growth of the grape vine. It is held as a general rule by some grape-growers, that vines, when cultivated in the open air, should have a site chosen on an elevation, as on a hill side facing the south. I am well aware that such locations are generally chosen in the grape districts of Europe ; but, observation has

given me reason to think that a well sheltered situation, with an open exposure to the south, on a level surface, will answer the best purpose in this country. If the season is favorable to the growth of the grape in this country, it will ripen in any exposed situation ; if it is unfavorable, then it seldom ripens in the most favorable aspects ; for it is the spring frost that hurts the young growth and often the blossom of the grape ; and, if a cold moist summer follows, neither the fruit or wood ripens till late in the fall, and if early frost appear, then neither fruit nor wood is properly ripened. The Isabella, and most native grapes, I have noticed to thrive and bear best in towns and cities on trellisses, situated on a southeast aspect, and I have also noticed that the elevated location of such places have not been so congenial to them as flat bottoms : this may be accounted for by the latter situation being less subject to the influence the sun and air and sudden changes the effects of which are more severely felt on high locations.

ART. 3.—*Propagation of the Grape Vine.*

There are many methods by which the grape vine is propagated or increased, as by the single eye, the cutting, the layer, and by seed. The most simple and successful, is by cuttings of the young wood, three or four eyes or joints long, which are inserted about half way in the ground, in rows eighteen inches apart, and six inches apart in the rows. The manner of performing the work is to prepare the ground well, by digging, &c., then set a garden line and insert your cuttings regularly by the proper distance, closing the ground well about them with the foot.

The management of the cuttings of the first year is simply to keep the ground clean and well cultivated.

If a shady location is chosen for the cuttings, they will root the better, many being lost in this climate, by drought. The best time of setting them is in the spring, when the frost has disappeared.

Second year's culture.—If the young plants are to remain the second year in the nursery, (which is by far the best method,) they should be pruned about the beginning of March, by cutting off their shoots to two or three eyes ; when the ground is open, if a quantity of good, rotten manure be thrown between the rows and neatly dug in, the plants will be much benefited. When the young shoots begin to grow, they are to be finger-pruned by breaking off all the shoots to three or four ; one of the strongest of these will require to be trained to a stake, and the others shortened when they are from one foot to eighteen inches long.

The ground between the vines will require keeping clean and the plants to be often looked over during the summer, and divested of their dead and sickly leaves, and any insects or other nuisance that may be hurtful to their health—and every means of good culture should be applied to grow them strong and vigorous.

ART. 4.—*Preparing the Ground and Planting.*

In all cases where the grape is to be planted, the ground should be well prepared, by putting on to it a quantity of rotten manure, and well ploughing or digging it to a proper depth.

Every precaution should be taken to take up the young plants without cutting the roots too near the stem. The roots should be traced and left at least two or three feet from the stem. When the plants are thus carefully taken out of the ground, they should be laid in a regular manner in the hole, about the same depth in the ground as in the nursery. Having planted the vines carefully, nothing more is required but to remind the planter, that good culture is always to be attended to, by digging, keeping the ground clean, and good management.

ART. 5.—*Summer Pruning of the Grape.*

The proper method of summer pruning the grape vine, is simply to regulate the young wood in such a manner that the sun and air has free access to every part of the vine ; those parts of the vine that are not so exposed, cannot obtain their proper quality, as the leaves of vines are analogous to the lungs of animals, and imbibe the air in a similar manner, therefore the quality is more or less perfect in proportion to its free exposure, and the young wood is the same. This may be clearly seen by examining a vine thickly covered with wood, the extreme branches of which are always healthy, because they have the benefit of the sun and air and every thing congenial to them. But, those which are thick and shaded are very weak, the leaves thin, turn yellow and decay ; the wood is soft, green, and sappy, and perishes in the winter, and is therefore useless : the bunches of grapes that are under the branches of the vine have small berries, and many of them drop off after rain and moist weather, and

those that remain are not well colored nor well flavored ; this is the effect of the absence of sun and air.

The regular process of summer pruning the grape vine is to commence early in the spring, as soon as the young shoots are grown three or four inches in length. The first thing to be done is to take off all the weakly shoots where two or three are growing together in clusters, leaving but one, the most healthy and vigorous. (*This is termed finger-pruning.*) The next operation is the *stopping the wood*, which is performed by nipping it off between the finger and thumb two joints above the bunches of grapes, which are at this time to be seen in all parts of the vine ; but care must be taken to leave strong, healthy shoots in a regular manner in every part of the vine, for young bearing wood for the next year without stopping. These shoots should be left about eighteen inches apart in every part of the vine. In this operation the shoots should be regulated at their proper distances and neatly tied with bass matting or strings, and the young wood and bunches of fruit should be as much as possible so placed as to have free access to sun and air.

When the young wood is properly regulated at equal distances, so that every part enjoys the sun and air, the after management is to take away all dead, decayed leaves, and keep the vine in every respect in a clean and healthy state. The lateral shoots should also be broken or nipped off at different times, that the vine may not be weakened by them. Lateral shoots are those which grow from the eyes of the young wood, and are of no use to the vine either at this time of growth or the next year's

fruiting wood, but draw a portion of substance from it in proportion to their number ; hence the utility of removing such shoots. In taking off laterals care must be taken to nip them off one eye from the main or longitudinal shoot : this is one grand point in summer pruning, which is often improperly done by nipping them too close ; the consequence is, that the eye bursts and grows at an improper season, which causes a barrenness the next year, owing to the neglect of leaving a proper bud, to carry off the superfluous sap, which is effected by leaving an eye on the end of the lateral, from which the current of sap is kept in motion ; the laterals must be often taken off and the bunches thinned when the fruit is as large as small peas.

The method of thinning is to leave the bunches as regular as possible in every part. One bunch should be left on a shoot of the present year's wood, where the branches are weak, and two on those of stronger growth ; and no more than two in any place.

The benefit arising from thinning the bunches is this ; the grapes are better flavored and the fruit finer ; the wood is also better ripened, and more vigorous, and every way better for fruiting the following season.

Winter pruning.—Pruning the grape vine has been held in such consideration in Europe, that different systems have been resorted to, and applied as a correct theory of art. They are the *Thomeroy*, the *Spurring*, and the *Caning*.

The *Thomeroy* is performed by forming the vine in such a manner that the old wood always remains forming the frame, and all the young wood is cut into two or three eyes for fruiting.

The *Spurring* is performed by cutting the vine so that spurs of the young wood are left from two to three eyes regularly over the vine for fruiting ; and in different parts the wood is cut to one eye for throwing out young wood.

The *Caning* system is performed by managing the vine so that the fruit is produced from canes of young wood, four or six feet long, which are cut off every alternate year ; and other shoots are regularly trained to take their places. Experience has taught me, that a medium plan between the spurring and caning system is the best.

The best time for pruning the grape vine is the middle of February, when the severity of the winter has acted on it so as to injure the soft wood, which is incapable of producing fruit.

The first consideration in pruning is to have a sharp knife, in order that the wounds where amputations are made, may be clean and smooth. All the soft and small wood must be taken out, and then a portion of the old, in such a manner, that the vine is regularly supplied in every part with young wood.

The principal object to be kept in view is to leave proper wood for fruiting, which is that of the last year's growth : the old wood serves as a main leader or frame of the vine. In selecting the fruiting wood, care must be taken to leave that which is well ripened ; the eyes should be plump and well formed, and so that every part of the vine is well supplied, about two feet apart, with young fruiting wood, the shortening of which must be according to their quality, to about ten or fifteen eyes of young wood, well hardened, which will be discovered by cutting it ; if the part intended to be left is not hard

and well ripened, it should be cut lower until you are satisfied.

Having thus selected your fruiting wood, the next consideration is to leave eyes for the next year's wood, which is done by cutting the shoots of last year's growth to two or three eyes, from which a supply of young wood will be obtained for summer training, as before directed, for the next year's fruiting. When the pruning is completed, the wood must be neatly tied with bass mat, or other string, to the trellis, and if any loose bark or rubbish be about it, it should be cleaned away.

NATURALIZING THE FOREIGN GRAPE.

ART. 6.—*Growing the Grape from Seed.*

It is little to be doubted that the native grape, as well as other fruits indigenous to this country, will be at no very distant day, much improved by raising new varieties from seed, especially if the native varieties are crossed by the foreign, as, the native Isabella with the foreign Black Hamburgh, and the Scupernong with the White Sweetwater, Chasselas, &c. of Europe.

From this crossing it is very probable that the flavor of the native varieties will be much improved, and at the same time they, being natural to the climate, will retain all the hardy qualities requisite to the country. It is much to be hoped that every encouragement will be given to such persons as enter into raising seedling grapes of the country: such persons should be patronized by premiums from the different Horticultural Societies, which would stimulate many to embark in a business that would

be really useful to all classes of people. When it is recollected that the crab apple is the primitive of all the fine varieties of apples now extant, which have been worked up to a fine quality mostly by culture and seedlings, it is as reasonable to suppose that the same improvement is to be made on the grape, in a few years. *A trial will most probably justify these remarks if properly and perseveringly followed.*

In trying the experiment, I would recommend that the Isabella grape, when in flower, be impregnated with the foreign grape, as the Black Hamburg; or, perhaps, the Burgundy would be more proper. From the seed of these grapes raise young vines by sowing it in pots of rich soil, early in the spring, and plunge the pots in a moderate hot-bed the beginning of March. When the young plants are well rooted, plant them in rows, eighteen inches apart, and train and manage them as directed, art. 3. When the seedlings are in a fruiting state, I recommend that the best varieties be selected for seed, and the same experiment be followed through three or four generations, until the desired object be obtained of producing varieties that are well flavored and ameliorated to the climate.

ART. 7.—*Naturalizing the Grape by Cutting, and Grafting.*

While I am on the subject of naturalizing the foreign grape, it may not be improper to give some hints on the probability of its being much facilitated by a continual raising of young vines, yearly, from cuttings; and grafting on the native varieties.

The experiment I would recommend to be tried

is, by first propagating the Black Hamburgh or White Sweetwater, from cuttings taken from a healthy vine, as near as possible to the root. The cuttings, I recommend to be of the last year's wood, and that which is hard and short-jointed; put the cuttings into a rich soil, in an open, exposed situation, where they may have the free access of sun and air and the changes of the season; the plants should be distinct by themselves so that nothing may retard their strong and healthy growth. Every facility should be given to encourage their growth, and any insect or disease that attacks them, if possible, be expelled. One shoot only should be allowed to grow from the cutting, trained to a stick, and not be allowed to lay on the ground, as it will be liable to be infected with mildew or other disease.

From the young wood of the vine, next to the old wood, the following spring, take another cutting from each plant of three or four eyes, which strike and manage as before recommended, throwing away the mother plant which will be useless in this process.

The same process may be continued for ten or fifteen years, when it is very probable the vines from the plants of that generation will be much naturalized and less subject to the disease natural to the climate.

Another process may be tried by grafting the foreign grape upon the native varieties taken from woods, by cleft-grafting, which should be done close to the ground. The young shoots from the graft may be managed as directed for the cuttings; and a new plant grafted yearly from the part next to the stock, on a fresh plant of the native vine.

In throwing out the above hints, I cannot pretend

that a certainty of gaining the desired purpose of naturalizing the foreign grape can be vouched from any practical authority or experiment that has been made under my knowledge ; but from an actual experience of many plants that have become hardened and naturalized by nearly the same treatment, I see no reason why the grape may not be brought to stand the climate in the like manner.

ART. 8.—*Diseases of the Grape.*

From general observation and many experiments I have been fully convinced that the native grapes, here recommended, when well cultivated, are seldom injured either by disease or insects, that most kinds of eatable fruits are subject to ; and that most kinds of foreign grapes, on the contrary, are affected by many diseases and insects, in a manner that will ever discourage their culture in the vineyard or open exposure, unless they can be naturalized to the climate. On a deliberate examination of the grape vine, I think the above remarks may be fully authenticated, and it will be found that the native grape vine is naturally of a more hardy and compact texture in its wood, leaves, berries, and indeed, in every part, than the foreign varieties : hence mildew and insects are not so likely to infect the native as the foreign grape. I am firmly of opinion that the casualties that happen to the grape, generally are more owing to the feeble nature of the vine, than any blights or insects that attack it at any period of its growth, although at the same time I am aware that the most healthy vines are often affected by disease and insects, in a greater or less degree. By

comparing the leaves of the native and foreign grape, it will be seen that the former are of a much firmer and more compact nature than the latter, and perhaps, as nature is ever perfect in her works, such leaves do not either perspire or respire so freely as those of the foreign grape, that are of a softer and more succulent nature ; and hence we may infer that the sudden changes do not act so injuriously on the native as on the foreign grape. The wood of the foreign grape is rarely well ripened in the fall, and has generally more pith than the native ; therefore, supposing it was not attacked by disease in the summer, the winter's severity and sudden changes would naturally act very severely on it, particularly on a southern aspect, where the sap is liable to be often frozen and thawed during the winter and early part of spring, which must certainly burst some of the sap-vessels and cause much injury to it.

The most injurious disease to the grape is the mildew, which always affects the weak and tender parts of the vine, as, the young leaves and tender branches, and from those to the bunches of grapes, which seldom recover when once diseased. I have never been fully satisfied that any cure can be made of the mildew when vines are much diseased ; I believe that when once a vine is affected in any part, the disease is soon conveyed to every part through the sap-vessels, and the constitution of the vine is so materially injured that it takes some time to recover it to its pristine health and quality.

Whether the mildew is an *animalcule* or *fungus*, I will not pretend to determine ; but I am of opinion that it is at first generated by a stagnation taking place in the leaf, in such a manner that the

pores of it are stopped ; the consequence is, that an impure matter is present which is imbibed by the leaf, which contaminates the sap of the vine, and is thence communicated to every part of it in a shorter or longer period. I shall not pretend to prescribe any remedy as a cure ; but remind my reader that good culture may, in a great measure, in this and every other case of disease, be the best remedy ; for certain it is, that all kinds of vegetables are most severely injured by disease when weakly, and the more healthy they are, the less liable to be affected.

ART. 9.—*Select Varieties of Native Grapes.*

The native varieties best adapted for arbors, and general culture that I am at present acquainted with, are the *Isabella* and *Catawba*, which are described as follows in "*Kenrick's Orchardist*," a work that should be in the hands of every fruit grower.

"*Isabella*.—This fine native grape is extraordinary for the vigor of its growth, and wonderful productiveness. The bunches are of a large size ; the berries are large and of an oval form ; the color is a dark purple, approaching to black, and covered with bloom ; the skin is thin, with but little pulp ; the flesh is juicy, rich, sweet and vinous. By hanging the bunches in a room, it has been ascertained that they lose that very small portion of muskiness they possess. This grape makes excellent wine, and requires no protection in this climate.

"*Catawba*.—This is an excellent grape for wine ; the bunches are of very handsome size and form, and shouldered ; the berries are a deep purple, next the sun ; the skin is thin, juicy, sweet, rich and

vinous, with a very little of the native or musky taste. This vine is very vigorous and hardy, and is a great and certain bearer."

Winnie.—This grape is much cultivated and esteemed in Albany, and is similar to the Isabella ; it is said to have been found by a Mr Winnie, of that place, from whom it derives its name, and is highly deserving culture as a native grape of the first order.

CHAPTER VI.

MANAGEMENT OF THE VINERY.

WHEN the many good qualities which the foreign grape possesses are taken into consideration, it may be said to excel almost any fruit as yet known in the forcing department. Its long tested qualities as being replete (when well ripened) with a rich, highly flavored, luscious juice, in connection with its handsome appearance, particularly recommend it to the dessert, in which it has been held in high esteem in almost all countries, for many years.

The produce of the grape, when well managed and the mildew can be evaded, is always encouraging in the highest degree, as, in most cases, the crop fully compensates those who bestow hot-house culture on it. To these, may be added, the longevity of the vine and a succession of fruit for the table when in eating, and, lastly, a very handsome appearance in a bearing state.

ART. 1.—*Planting and Preparing the Vinery.*

The preparing and planting the Vinery should be carefully attended to, as the future produce will

much depend on its being properly managed at first. The house may be of almost any construction ; but that of a moderate size is the best—one of about forty feet long and fourteen feet wide, in the clear, built in such a manner as to admit of glass three feet in front, and the back, which should be of brick, of a height to allow an elevation of 45 degrees, when the roof is put on, *which should be all glass*. In the inside of the house a pit may be built of brick, six feet wide and four feet deep. The pit may be in the centre of the house which will admit a walk, each side, of four feet wide, and the same may be allowed in the end. A pit of this kind may be turned to good advantage in the winter for preserving lettuce, celery, and other vegetables which require the frost only to be kept away from them. About the beginning of March the pit may be cleaned out and a quantity of hot manure put in to make a moderate hot-bed, which, when the heat begins to rise, may be earthed with good soil for the purpose of sowing on it radish, cabbage, lettuce and such early salads and plants as are wanted for family use. A part of the pit may also be used for forcing of asparagus, tart rhubarb or pie-plant, and any kind of perennial herbs, as mint, tarragon, and the like ; indeed, a bed of the kind may be made generally useful. The culture and heat requisite for such plants will also be congenial to starting the vines in a strong, vigorous manner. A few green-house plants may be accommodated in the vinery, placed on the curb of the pit and back of the house ; but I cannot by any means recommend it to be entirely appropriated as a green-house to winter plants, which in the spring must be much injured by being shaded

with the vines, and the heat and moisture requisite for the grape being quite contrary to the health of the green-house plants. On the other hand, the foul effluvia that will arise from the soil and perspiration of the green-house plants will settle and condense on the leaves of the vines and bring on a disease; the young bunches of grapes will decay and drop off, and in fact, to be candid, it is impossible for any person to do justice to anything so opposite in nature as green-house plants and the grape vine, at an early season.

When grapes are intended to be grown in hot-houses, every other thing accommodated should be considered as temporary, and the grape should, in every way, be accommodated, as near as possible, to its nature, or little good can be expected.

Location.—I have most generally found the vine-ry to do best, by being located on a rising situation, protected at the north and north-west quarter by a plantation of trees or buildings. It should be so situated as to face to the south or south-east quarter; but the latter I would recommend, as in that aspect it will receive the morning sun, so congenial to the grape vine.

Preparing the border for planting.—The border for the vine-ry may be prepared by digging out the soil, three feet deep, in front of the house, and from twelve to fifteen feet wide; or, as wide as the vines have to traverse under the roof, will perhaps, be a better criterion, as most plants, the vine particularly, are found to extend their roots in the earth as far in length or distance as they grow in height. If the bottom or sub soil is wet, it will be better to dig out the soil a foot deeper than is requisite, and fill it up

with old mortar, rubbish, or anything that will drain off the water ; as the grape always thrives best on dry bottoms. When the border is thus prepared, it will require to be filled with compost in the month of September.

Preparing the Compost.—The compost, which I have mostly found to answer the best purpose for the vinery, is a mellow loam, well incorporated with one third part of rotten manure, or, in order to have a border prepared in a superior manner, *the top sod of a rich, loamy pasture* may be taken off six inches deep, and thrown into a heap with one third rotten manure ; and if a portion of manure from a slaughter house is added, it will answer a good purpose.

The compost may be thrown into the pit or border, where it may lay a month or two to get into a state of fermentation, when it should be turned and well mixed as a manure heap. This may be done two or three times in order to incorporate it well together. I would also recommend about 50 lbs. of sulphur to be mixed with the compost, the last time of turning, which will destroy many insects detrimental to the vine, and act as a stimulant to it.

Planting the Vines.—In planting the vinery every precaution should be taken to procure select kinds of grapes of respectable nursery-men, who can be relied on as to correctness. I have often seen grape-houses furnished with ordinary sorts of grapes, owing to injudicious selections, which have been replanted at a great expense, and the loss of two or three year's growth, which is considerable in such cases. The vines for planting should be at least two years old, and if raised from the eye the

better.* The best time for planting is early in the spring, about the latter end of March. The vines may be planted as directed, under the head of planting. One plant to each rafter may be planted outside the house, in front, in such a manner that it can be introduced into the house by a hole four inches in diameter, cut under the front sill directly under the rafter.

ART. 2.—*First Year's Management.*

The only thing requisite in training vines the first year, is to train up one shoot under the rafter from each vine in a straight manner, on a wire placed directly under it, about twelve inches from the glass. The lateral shoots should be managed as before directed, by kipping in with the finger and thumb nails to within one joint of the main shoot.

Syringing the Vines.—On the mornings of fine clear days, the vines will require a gentle syringing,† and in the evening, also, when the leaves can be dried after the operation; but it may always be omitted in moist weather, particularly late in the season, in order to ripen and harden the wood of the vines, and the house in every part should be kept as dry as possible. Particular care should be taken at *all times* to keep the house clean and wholesome, that a healthy internal air may always be present, which will greatly facilitate the growth of the vines.

* Mr Wm McCullough of South Boston, has fine plants of grapes raised from the eye, and being a practical cultivator, the kinds can be warranted of the best quality.

† A superior instrument for this purpose can be purchased of most Nurserymen and Seedsmen, at from five to seven dollars each.

ART. 3.—*Second Year's Management.*

Pruning the Vines.—The vines should be pruned in January or February, more or less, according to their structure ; but the grape makes such luxuriant wood in this country, that I have known fine crops of grapes taken from the second year's growth. However, it is a system which I cannot recommend, nor, indeed, for any fruit trees or vines that are to acquire a large growth. If the habit is strong when young, it will be sure to be weakened in time. But I would not advise, in any case, for nature to be impeded, by any process, to hasten fruiting ; which will always, in a measure, retard the future growth and luxuriance of trees, vines, &c. Therefore, the method that I would recommend is, to shorten the vines to two eyes at the end of the rafter at the front of the house, in order to take one or two canes up the second year, and the vines may be treated in every way as in the first year of their management.

ART. 4.—*Forcing the Grape.*

Pruning the Vines.—The first consideration in grape-forcing is in pruning the vines, which may be performed any time in the month of January or the beginning of February. The methods, as before stated, are various. The most simple and generally adopted in this country with the greatest success, is that which is recommended in art. 5, chap. v.

Forcing the House.—Supposing the pruning to be performed, and the house to be begun, the latter end of February, or the beginning of March,—begin by first merely warming the flues at night, and giv-

ing air on a fine day, to get the house and flues in good order, which will be in a few days ; when the fire heat may be kept at night to 45° , and the sun heat to 60° , for a week or two, to get the sap in circulation, when the fire heat may be raised to 50° or 55° , and the sun heat to 65° or 70° , with air, on a very fine day. During the process, the vines must be well syringed on each fine morning, and slightly in the evening after a sunny day, as they will, in that case, be in a dry condition and imbibe the moisture freely, which will greatly facilitate breaking the buds strong. The best time of syringing in the morning varies with the season ; early in March, the house should be warmed with the sun before the syringe is applied, or it will be much chilled by the operation. As the season advances, the operation may be performed, by degrees, earlier in the morning, and in time it may be performed at sunrise ; but, in all cases, it must be performed in such a manner that the vines will soon dry. Wet, remaining on any plant long in the process of forcing, is, in all cases, injurious, by overcharging the surface of their leaves with water ; for, in that condition, they are not capable of going through their proper functions of *perspiration* and *respiration*, owing to the pores of the leaves being stopped with water ; consequently, sickness must ensue in proportion to the deprivation.

When the vines begin to break at the eye, an inch or two long, they are to be finger-pruned by breaking off the side shoots, leaving only one, which should be the centre, which contains the fruit in embryo. The side shoots are what are generally called by gardeners *water-shoots*, and require in all cases to

be taken off at an early period, *as they are injurious to the vine by drawing nutriment to an unfruitful branch.*

When the shoots begin to show fruit bunches, the heat may be raised at night to 60° or 65° ; at all events it should never be under 60° after this period. The sun heat may be allowed to run 75° or 80°.

Finger Pruning.—The vines may now be finger pruned by taking away all useless shoots with the finger and thumb, and leaving the young wood as regular as possible in all parts of the house. The young wood may now be stopped where fruit bunches show one or two eyes from the bunch, by nipping it off a little above the joint with the finger and the thumb. The weak shoots may be stopped one joint, and the strong, two from the bunch. But where the young wood is wanted to fill up vacancies, the shoots may be left two or three feet in length to furnish such places.

Regulating and tying in the young wood.—The next thing to be attended to is the tying in, and regulating the young wood, which should be very carefully done by tying in the shoots neatly to the trellis, with bass string, in a regular manner, so that every part of the vine has free access to sun and light. The lateral or side shoots may also be stopped one eye from the main shoot as before directed; and every part of the vine should be kept neat and clean.

Management of the house, in flower.—When the vines begin to flower or blossom, the syringe must be suspended ; as moisture too plentifully applied, will, in a measure, injure the setting of the young berries or fruit, by their being damped off ; but care

must be taken to keep up a moist brisk heat, as too much cold retards the growth of the young fruit, which will be perceived by the bunches turning up at the point, which is *always a bad sign*. The bottom of the house and flues may be kept moderately moist in order to give a moist heat. The temperature of the house may be kept at night, at fire heat, from 65° to 70°, and sun heat in the day from 80° to 85° with air, which may be continued until the ripening of the fruit.

Swelling the fruit.—So soon as the fruit shows in the bunch as large as a very small pea, apply the syringe in a very gentle manner. It will be recollected that the fruit in this state is very delicate; apply the syringe, if in a partial manner on a few bunches that are *set* over the flue at the warm end of the house. When the whole of the house is well *set*, syringe regularly in the morning a little after sunrise, in order that the vines may get dry before it is too strong; and in all cases give a little *air* in the least possible quantity at the back of the house. A brisk moist heat may be kept up, and the house always closed about an hour before sundown; but care must be taken that it is not too *damp*, which is sometimes, perhaps, the cause of mildew.

Thinning the bunches and fruit.—When the bunches are all *set*, and all is going on well, the house may undergo a regular thinning of the bunches, and I would recommend in most cases that one bunch only be left on a weak shoot, and two on a strong. Remember you want fruit next year, and if you overload this, some deficiency will be in the next, if not the present year. The fruit will not be so well ripened, nor good in quality, and besides, you

will bring on a weakness by a heavy crop, and perhaps that pest of vegetation, the mildew. I must call your attention to thinning the fruit in the bunch, which will require to be done in a neat, clean, and expeditious manner. The time is when the fruit is as large as a small sized pea. For the purpose procure a pair of scissors with long handles and narrow pointed blades. In the operation commence thinning the grapes at the point of the bunch, by taking out all the small sized berries and part of the large, in a regular manner ; so that each will have equal room to swell in the bunch to its proper size, which must be judged according to the natural size of the grape, when fully grown. In this operation care must be taken not to prick any of the fruit or any part of the bunch with the scissors, nor bruise them with the head, hands, or by any other means, which will greatly injure the growth of the berries in this stage.

The vines may now be regularly gone over by stopping the young shoots, tying in, and the like, as before directed.

Stoning the fruit.—When the fruit is grown nearly to its size, it will begin to swell its seeds or stones, which will be perceived by the grapes making but little growth. At this time the house should be kept in a moderate temperature ; at night about 65 degrees, and in the day from 75 to 80 degrees. The vines may now be moderately syringed, but not too much ; as, at this period, it will be recollected that the fruit is not in a growing state, and consequently, cannot imbibe so much moisture. When this process is over, which may be ascertained by cutting

the berries and finding the seed hard, the syringe may be more generally applied. The temperature may be now a little raised in order to swell the fruit more freely ; and every precaution must be taken to keep a clean and wholesome air in the house.

Ripening the fruit.—When the fruit begins to color, the syringe may be suspended, and the house be kept dry. The temperature may be kept from 70 to 80 degrees fire heat, at night, if the fruit is in haste to be ripened, although 70 degrees will answer a better purpose if not in haste. Plenty of air should be given in a fine day in order to color and give flavor to the fruit ; in this manner the house may be managed until the fruit is all ripe and cut from the vine. The sashes should then be taken off and the house fully exposed to the sun and air, in order to ripen the wood previous to the ensuing winter, when the glasses may again be put on the house.

General remarks on grape forcing.—The experienced forcer will perceive that the heat herein recommended is somewhat higher than is generally recommended by practical forcers, who have written on the grape in England ; my object in which is to bring the fruit to maturity early in the season, to evade the mildew, which in most cases is destructive to the grape late in summer. My secondary object is, considering this climate of a more clear atmosphere, and more sun in the early part of the spring, admitting more external air to the house, which should be modified by internal heat from fire, in which case I have generally found the impure vapor ascending from internal heat is much rectified by the admission of the external air.

ART. 5.—*On the Culture of the Grape in the Vinery.*

When the many good qualities which the foreign grape possesses, are taken into consideration, it may be said to excel almost any fruit as yet known in the forcing department. Its long tested qualities as being replete, (when well ripened,) with a rich, highly flavored, luscious juice, in connection with its handsome appearance, particularly recommend it to the dessert, in which it has been in high esteem in almost all countries for many years.

The produce of the grape when well managed, and when the *mildew* can be evaded, is always encouraging in the highest degree, as, in most cases, the crop fully compensates those who bestow hot-house culture on it. To these may be added the longevity of the vine and a succession of fruit for the table when in eating, and lastly a very handsome appearance when in a bearing state.

Location of the the house, preparing and planting,—The location most adapted for the vinery, is on a dry situation, facing to south or southeast quarter, well protected on the north and northwest quarter, with a plantation of trees or buildings and so situated as to have a full share of the morning sun, so congenial to the grape.

The preparing and planting the vinery should be carefully attended to, as the future produce will much depend on its being properly managed at the first. The house may be of almost any construction, but that of a moderate size is the best. One of about forty feet long and fourteen wide, in the

clear, built so as to admit three feet of glass in height in the front ; and, the back, which should be of brick, of a height to allow an elevation of forty five degrees when the roof is put on, *which should be all of glass*, will answer a good purpose. In the inside of the house a pit may be built of brick, six feet wide and four feet deep. The pit may be in the centre of the house which will admit a walk four feet wide each side of it, and the same or more may be allowed at the end.

A pit of this kind may be turned to good advantage in the winter for preserving lettuce, cèlery, and other vegetables which only require the frost to be kept away from them. About the beginning of March the pit may be cleared out and a quantity of hot manure put into it, to make a moderate hot-bed, which, when the heat begins to rise, may be earthed with good soil a foot deep, for the purpose of sowing on it radish, cabbage, lettuce and such early salads and plants as are wanted for family use. A part of the pit may also be used for forcing asparagus, pie plant, and any kind of perennial herbs, as mint, jargon and the like ; indeed a bed of the kind may be made generally useful. The culture and heat requisite for such plants will be also congenial to starting the vines, in a strong, vigorous manner. A few green-house plants may be accommodated in the vinery, placed on the top of the pit, and back of the house ; but I cannot, by any means, recommend it to be entirely appropriated as a green-house to winter plants, which in the spring must be much injured by being shaded with the vines, and the heat and moisture requisite for the vines being quite contrary to the health of green-house plants. On the other

hand, the foul effluvia that will arise from the soil and perspiration of the plants, will settle and condense on the leaves of the young vines, and bring on disease; the young bunches of grapes will decay and rot off, and, in fact, it is impossible for any person to do justice, to anything so opposite in nature as green-house plants and grape vines, at an early season.

When grapes are intended to be grown in hot-houses, every other thing accommodated should be considered as temporary, and the grape should, in every way, be treated as near as possible to its nature, or little good can be expected.

Preparing the border for planting.—The border for the grapery, is generally prepared on the outside of the house, of the length of the front, and the vines are planted close to the front walk, and brought into the house under the sill, one vine under each rafter. The manner adopted is to dig out the soil from two and a half to three feet deep, and from twelve to fifteen, or as wide as the vines have to traverse under the roof, will perhaps, be a better criterion, as most plants (the vine particularly) are found to extend their roots in the earth as far in length or distance as they grow in height. If the bottom is wet, it will be better to dig out the soil a foot deeper, and fill it up with old mortar rubbish, or anything that will draw off the water, as the grape vine always thrives best on dry bottoms. When the border is thus prepared, it will require to be filled with compost, in the month of September.

Preparing the compost.—The compost which I have found to answer a good purpose, for the vinery is a mellow loam, well incorporated with one third

rotten manure, or, in order to have a border prepared in a superior manner, the top sod of a rich, loamy pasture may be taken off six inches deep, and thrown into a heap ; if one-third rotten manure from a slaughter house is added it will answer a good purpose.

The compost may be thrown into the pit or border, where it may lay a month or two to get into a state of fermentation, when it should be turned and well mixed as a manure heap. This may be done two or three times, in order to incorporate it well together. I would also recommend about fifty pounds of sulphur or a barrel of air slacked lime to be mixed with the compost the last time of turning, which will destroy many insects detrimental to the vine, and act as a stimulant to its growth.

Planting the vines.—In planting the vinery every precaution should be taken to procure select kinds of grape of respectable nursery-men, or amateurs, who can be relied on, for correctness. I have often seen grape-houses furnished with ordinary sorts of grapes, owing to injudicious selections, which have been replanted at a great expense and loss of two or three years' growth, which is considerable in such cases. *The vines for planting should at least be two year's old, and those raised from the eye and rooted in pots expressly for the purpose, are the best.** The best time for planting is early in the spring, about the latter part of March or beginning of April. One plant to each rafter may be

* Fine plants of this description have been cultivated by Mr McCullough, of South Boston, this year, 1838 ; a scientific and practical gardener, who can be relied on as to the correctness of his varieties.

planted outside the house, in front so that it can be introduced into the house by a hole four inches in diameter, cut under the front sill directly under the rafter through which the vines are to be introduced to the inside of the house.

PART FOURTH.

MISCELLANEOUS ARTICLES

AND

DESCRIPTIVE LISTS.

CHAPTER I.

ART. 1.—*On Gathering and Picking Fruit.*

THE manner of gathering or picking fruit is by many persons considered of so simple a nature, that it requires no very particular attention. It seems unreasonable to suppose that choice fruit, after much trouble and expense in cultivation, should be injured in its flavor and appearance by the mere act of picking, and conveying even a short distance, but such is often the fact.

In order to illustrate the above remark, it will be proper to direct the attention of the reader to subjects which may be duly investigated in their proper seasons.

The strawberry, one of the earliest and best fruits, is often not only deprived of its natural beauty when placed on the table, but also much of its fine qualities by improper picking and bringing to table. In picking it is generally deprived of its strig, calyx,

and receptacle, in doing which the fruit, or pulp, is compressed between the finger and thumb, and detached from those parts by the pressure, by which the fruit is often much bruised, and injured in flavor. In this state it is conveyed in baskets, boxes, &c., to its destination, and when prepared in dishes for the table, it has more the appearance of a jam, than of a fruit from the vine to be eaten separately; whilst if it had the strig and natural appendages, its appearance would be extremely handsome. So much for appearance. The next consideration is quality; which is evidently partly destroyed or lost by the pulp being bruised and exposed to the air. The raspberry, the next fruit in question, bears the same fate, in every particular, as the strawberry. That refreshing fruit, the cherry, is often badly treated, although in many cases its strig is allowed to remain. The currant, however, is worse managed; the general method being to grasp whole handfuls of the fruit at once, some of which is badly bruised, others quite broken, and some bunches left entire, mashed with the juice of others which have met a worse fate.

However custom might have sanctioned the above methods, I think prudence should dictate a more proper manner of picking and bringing to the table those choice fruits which are so bountifully bestowed on mankind. I hope the following methods will receive some attention from my readers, even if they are not inclined to adopt them.

The strawberry, raspberry, currant, &c., I would recommend to be picked *with their strigs entire, when intended for the dessert*; the strigs to be nipped asunder, between the thumb and fore finger

nails, and care taken not to squeeze the fruit in the operation ; when picked, put it in small boxes or baskets, with leaves at the bottom to keep it from bruising, and in this manner let it be kept until it be removed into proper dishes designed for the table.

Plums, apples, pears, indeed all kinds of fruit, are greatly injured by being deprived of their strigs in picking. They are not only deformed, but seldom keep any length of time. Any common observer will at once discover that the strig of fruit is intended by nature as its handle, and therefore should not be extracted from it.

In closing these remarks, I beg leave to caution those unacquainted with the management of fruit of the great importance of handling it, when gathered, in a careful manner ; for certain it is, that in many cases quantities of fruit, intended to be kept for a length of time, are rotted and decayed, owing to its being bruised when picked and put away. It is almost impossible to be too careful in the management of fruit intended to be stored for the winter.

In picking fruit for preserving through winter, care should be taken that it is ripe before gathering, which may be ascertained by examining the kernel or seed, which, if black and ripe, the pulp or fruit will be ripe also. Having ascertained that the fruit is ripe, the next thing is the picking or gathering of it into winter quarters ; this should be carefully done, and, let me here remind the reader that the handling or taking the fruit from the tree is an operation which requires considerable knowledge ; and, let no one who does not understand the nature of this thing practically, despise the following hint on the subject. In picking fruit from the tree it should

always be the rule to take the strig with it entire, if possible. This is of the greatest importance where fruit is kept through the winter, because if taken from it, the rind is broken where it was united to the pulp, and at that place it will begin to decay, when closely confined, and hence soon communicate the rot to others, and so on until the whole is infected.

ART. 2.—*Planting Live Fences.*

When land is to be divided or enclosed for fruit gardens or orchards, it may be effected by planting live fences of different varieties of woody plants; but those of a dwarf thorny nature are found to answer the best purpose in most cases, being more proper to guard against cattle and other intruders, than those without armature.

The plants used for such purpose, are those varieties which are found to thrive well in different parts of the states, and if natives the better, being more hardy and better able to withstand the changes natural to the climate. The European hawthorn is perhaps the best plant for this purpose, although it does not answer equally well in all parts of the country. In the New England States, particularly, this plant is liable to be destroyed by mildew and the borer; but in the state of New York, it does much better. The buckthorn, or *Rhamnus catharticus* of Linnæus, is now much planted in New England, and answers the purpose admirably well. To this may be added the *Shepardia eleagnoides* (of Nuttall), or Buffalo tree, which I am inclined to think, when it has had a more general trial, will su-

persede anything that has hitherto been introduced for the purpose. The locust, white mulberry, sweetbriar, beach, and many varieties which have been cultivated for other uses, may be added to the list ; but, as my object is to give directions regarding live fences to enclose orchards, &c., I shall proceed to treat on that subject.

Sowing the seeds of plants for live fences.—The seeds of different varieties of plants for live fences, are generally sown in nursery rows eighteen inches wide and two feet between the rows, or they are sometimes sown in four feet beds with eighteen inch or two feet alleys, in the manner explained in the nursery department. The autumn is the proper season for sowing, or so soon as the seed is ripe. Such seeds as have a hard covering, as the locust, should have their outer covering softened by boiling water being poured over it, as the seed will not vegetate unless its covering is so softened as to admit air and moisture to it.

Planting the fence.—When the young plants are one or two years in the nursery rows, they will be fit for planting. The ground intended to be planted should be previously prepared for it, by cleaning it well, and working in a quantity of good rotten manure. The planting may be performed by stretching a garden line where the location of the fence is designed ; the plants may then be inserted in a single row, six inches apart, by the spade or dibble ; but the former I would recommend. The work is done by placing the spade parallel with the line, and pressing it down with the foot and hand to the depth required for the plant, when it is to be drawn three or four inches forward to admit the plant to be put in

at the cavity at the back of the spade, which is to be taken out, and the earth closed to the plant by the right foot. Two persons are required to perform the work, one to use the spade and one to insert the plants.

The plants will require to be kept clean during the summer with the hoe, and the following spring a sprinkling of well rotted manure may be spread by the sides of the rows and neatly dug in with a spade. The next year the management is the same as regards keeping clean, &c. The third season the plants may be headed down to two or three buds or eyes, and the ground well worked and kept clean, indeed young live fences of this kind should always be kept in the best of order. The fourth year the plants may be headed down to within six inches of the root, and the sides cut thin, so as to form a hedge of a narrow roof-like appearance, or, to give a more definite idea, like the mane of a horse.

Training, or after-management. — When the plants are of a proper strength they are to be pruned or brushed once or twice a year—in the fall and spring, after the young shoots have made about six inches of wood. The hedge should be kept as thin as possible on the top, tapering from the bottom, which should be kept thick and above two feet and a half through. It should be increased to six feet in height which will be sufficient in most cases, but where it is required to be higher, it may be gradually allowed to attain a greater height. Keeping it clean and a regular management the first few years, is the principal object that must be strictly attended to.

ART. 3.—*On Protecting Fruit Trees.*

The protecting of fruit trees taken in its most extensive sense, may be considered as a very important item in the culture of fruit. I have, under the several heads in preceding articles, pointed out the utility and methods of protection in a brief manner, when it has appeared to be essentially necessary. I shall here in a measure recapitulate those hints, and combine under one head every thing that seems of importance as regards the protection of fruit trees.

In the first place, it is pretty certain that unless fruit trees are planted where they can be sheltered from the cold northern blast, little good may be expected from their culture. By observation it will be seen as before stated, that where apple orchards are situated on ground partly high and exposed, and partly low and sheltered, trees on the latter will flourish and bear abundant crops of fruit, whilst the former is poor, eaten up with moss, and bears thin crops of poor, meagre fruit. Now, as these trees were all planted at one time, and received the same culture, it is evident the difference is partly owing to their being in the more or the less exposed situation; although it is certain that difference of soil has some influence on their growth. The same may be stated of most kinds of fruit trees; although the cherry bears and thrives on a poor, sandy, exposed situation better than any other.

Where fruit orchards or gardens are planted on a flat plain land, they should be protected by planting a row of forest trees to break off the winds and storms on the cold quarter. In the management of this business, some judgment is required, or the evil

will be greater than the benefit. In the selection of trees for this purpose, care should be taken that they are chosen of an upright and rapid growth—thick and bushy in branches and leaves ; they should also be of that kind that do not extend their roots to too great a distance under the ground so as to impoverish the orchard or garden they are intended to protect. The elm is of this kind. The best trees for this purpose are among the evergreens ; the pine, the balsam fir, and the arbor vitæ ;—the deciduous trees ; the sugar maple, the horse chesnut, and the locust, are good examples. The elm, the button-ball, the American lime, are all fast growing trees when young ; but they soon spread their roots to a distance and net the ground over to some distance about them, and finally impoverish and exhaust the soil to a very great degree. To this general kind of protection, that of a partial nature is to be considered as protecting certain kinds of trees from the winter's severity. The foreign raspberry forms a prominent character in this part of the business, for although it flourishes and bears admirably well in this climate, its wood or canes do not sufficiently ripen to bear the cold winters here ; the canes have therefore to be carefully bent down at the approach of winter, and covered with earth or other substance in order to screen them from the cold and sudden changes in winter. The foreign grape, as the White Sweetwater, Black Hamburg, and other foreign varieties cultivated out of doors, are subject to the same injuries, and require like care, and indeed in many cases if the native grape were laid down and partially covered in the winter, it would be much the better for such treatment. In some

places I have seen the peach tree bent down on one side and partly protected by covering earth over some of the branches, but it is a system I cannot recommend because the trouble is always treble the profit. In some cases trees are protected by covering their branches with coarse matting, as bass-mats or other coarse articles of that texture ; in others, clean straw is neatly placed and bound round plants, which answers a very good purpose for dwarf trees. The neatest manner of doing this is first to tie in the branches of the tree or plant closely and neatly together, and place the straw smoothly around it, which should be bound neat and tight, with strong yarn strings, or wisps made of basket willow or other pliable wood.

To the foregoing remarks it may be added, that almost every kind of young trees require to be slightly protected in a nursery state. This may be effected by covering, with leaves, soil or horse manure on the rows or beds ; but care must be taken, not to cover too heavily so as to press down the plants and break their stems.

To these different methods of protection, that of protecting trees and vines in blossom may be added. This partial covering is necessary to guard off frost and cold cutting winds, and may be effected either by covering at night with mats when against walls or trellis, or using old netting, gauze or other thin substance that may remain always before the plants or trees to break off frost, wind, and other detrimental causes.

ART. 4.—*Culture of the Tomato.*

The Tomato being at the present time so much esteemed as an excellent fruit, and its use in cookery in various ways, as sauces, catsups, &c., and as a pickle when green, induces me to give some hints on its culture.

The plant is an annual, and a native of a warm tropical climate, requiring about the same heat to grow to perfection as the cucumber.

The best mode of culture, to have the plants early, is to sow the seed in pots in a cucumber frame, about the middle of February or first of March. When the plants have two or three rough leaves, they may be potted into small pots into a light rich soil, and treated as cucumber plants; after they are well rooted in these small pots, they may then be shifted into smaller sized, to obtain a strong growth before being planted out into a fruiting bed. As the weather grows warm, the beginning or the latter end of April, the plants should be placed into a separate frame to harden off, and plenty of air given as the warm weather advances; and finally the sashes may be wholly taken off previous to their being planted into an open exposure for fruiting, which is about the twentieth, or latter end of May.

The situation and soil to grow the tomato early, is a side bank facing to the south of a poor gravelly or sandy nature. Prepare the ground for planting in the usual way by digging or ploughing. This done, make holes five feet apart in rows from each other, by taking out two shovels full of earth, and placing thereon the same quantity of good rotten manure; then carefully turn out the plants

with the ball earth entire into the centre of the manure, closing it well round the roots; this done, place a wisp of straw, hay or long grass, around the stem, to protect the plant from wind, frost or other accidental causes that may injure it; or, some short litter or horse-dung may be thrown around the stems to protect the plants.

The plants being thus planted, the ground between the rows requires to be kept clear and well worked, similar to Indian corn or the potato.

It is a great error of many persons, to force the tomato in a deep rich soil, in order to ripen the fruit early. This is altogether incorrect, as the luxuriant state of the plants puts it into a state quite the reverse to that of fruiting; for, when this is the case, the thick leafy state of the vines shades and prevents the fruit from ripening, besides collecting moisture in a manner that the fruit and leaves cannot dry freely, and eventually rot and decay.

Many persons grow the tomato against boarded fences, trellisses, &c., on a south aspect, where they are trained in the manner of fruit trees, by thinning out the shoots and tying or nailing them to the fence or trellis. In this management care must be taken that the soil is not too rich that the tomato is planted into, nor that the vines are allowed to run too thickly together, either will prevent the fruit from ripening.

ART. 5.—On the Culture of the Pie Plant.

The pie plant or *Rheum rhaponticum* is one of the best substitutes we have at an early season for green tarts ; its flavor when cooked is a pleasant acid, and partakes of that of the green apple and gooseberry. The manner of cooking it is simple and most generally done by taking the green stalks and cutting them into small square pieces, putting it into crust and baking as an apple tart ; or it will make an excellent pudding by using it in the same way as the apple. Many persons also use the pie plant as a sauce, and stew the stalks after being cut into small pieces precisely the same as the apple.

Culture.—The pie plant is increased by seed and cuttings ; the latter is the best and most successful way. The seed may be sown early in the spring on a rich, deep piece of ground in drills three feet apart : it is essentially necessary that the ground be made rich in order to grow the plants in a strong, healthy state the first year for planting. The cuttings are increased by dividing the crown of an old plant into small pieces, each having a bud or an eye to it. These cuttings are to be planted in rows two feet apart the same as the seed.

Planting out the bed for fruiting.—The rhubarb requires a rich, deep soil in order to grow the young stalks crisp and luxuriant. Therefore prepare the bed by manuring the ground well with a good coat of manure, and dig it in a good depth. This done, level the surface, and mark out the ground in rows four feet apart ; in the angle of each take out two or three shovels full of soil, and place therein

two or three shovels full of good rotten manure, and place the plant therein, healing it over with soil. The after management is to keep the ground well manured and dig it every fall, and give it the very best of culture.

Rhubarb is often forced or forwarded in the spring by placing over the crown of the stools an empty barrel, and covering well around the outside with horse manure, old tan, or other substance to start it into growth early. Many other methods may be successfully applied, as forcing in large pots or tubs, in the vinery or any other glass-houses where the temperature is kept a few degrees above freezing. Where it is required early, (and nothing will pay better,) it may be forced in a garden frame. To accomplish this, procure at the beginning of March a quantity of hot horse manure, and if a portion of oak leaves preserved in the fall is mixed with it the better, prepare the bed by mixing and getting the manure in a state of fermentation; then make up the bed, place the frame over it, and put into six inches of light earth or old tan; place the roots over it, and close the frame to draw the heat, and manage it in the usual manner by giving air by day, covering by night, &c.

CHAPTER II.

DESCRIPTIVE LISTS OF SELECT FRUITS.

IN forming a descriptive list of fruit, the principal object has been to choose those kinds that bear good crops, generally useful, and good in quality. In doing this many very excellent kinds have been omitted, owing to their being either tender trees or uncertain bearers.

In my description I have in a measure been guided by the local places where the kinds recommended have borne well, which in many cases have been pointed out. And, as none have been recommended except those which are of the best quality, little has been said of their peculiar merits, nor indeed would it be proper to devote much room, in a small manual of this kind, to the science of Pomology, which has been done by more able hands. In forming my lists, I have been principally guided in the descriptive qualities of fruits, by Mr Manning's Book of Fruits, and Mr Kenrick's Orchardist, which I recommend to the young fruit grower as works of the first order for reference to the different kinds of fruits, and their qualities.

DESCRIPTIVE LIST OF STRAWBERRIES.

The principal object of a descriptive list of the strawberry in this place, is to point out the best bearing kinds, and those that will give a succession

of fruit during the season. The descriptions which here follow are from Kenrick.

1. *Scarlet.*

“A very early variety, of an excellent flavor ; middle sized fruit of a scarlet color, and should always be planted as an early fruit.”

2. *Roseberry.*

“An abundant bearer ; the fruit is large, conical, pointed, dark red, hairy, with a very short neck. The early fruit is sometimes cockscomb shaped ; seeds yellow, deeply imbedded, with ridged intervals ; flesh firm, pale scarlet, with a core ; flavor not rich, but agreeable, and much admired by many.”

3. *Black Roseberry.*

“The fruit is of good size, obtusely conical, deep purplish red, and shining ; the seeds are slightly imbedded ; flesh dark red near the outside, solid, buttery, juicy, and of excellent flavor.”

4. *Grove End Scarlet.*

“A first rate strawberry and an abundant bearer. The fruit is of considerable size, depressed, spherical, of a bright vermilion color ; seeds slightly imbedded with flat intervals ; flesh pale scarlet, firm, with a core ; flavor agreeable and slightly acid.”

5. *Methven Scarlet.*

“Fruit very large, cordate, compressed, or cockscomb formed at times, or conical ; dark scarlet. Seeds pale yellow, not deep set. Flesh scarlet,

very woolly, sometimes hollow ; highly esteemed with us."

6. *Keen's Seedling.*

"The fruit is very large, globular, or ovate, of a dark purplish scarlet, hairy. It sometimes assumes the cockscomb shape. The surface polished, seeds slightly imbedded ; flesh firm, solid, scarlet, high flavored. Introduced to the vicinity of Boston, by Mr Pratt. Also to this country and to notice, by Mr Haggerston, of the Charlestown vineyard. In this strawberry are combined great beauty, extraordinary size, excellent flavor, and productiveness. The fruit grows high, which is much in its favor. Raised by Mr Michael Keen, from the seed of Keen's Imperial, which is a good fruit but very inferior to this."

DESCRIPTIVE LIST OF THE RASPBERRY.

The raspberry, like the currant, requires but few varieties to have every satisfaction in the fruit. The Red and White Antwerp are the two best kinds, and have been known and introduced more than a century. To these may be added, the Franconia, Mason's Grape, and other superior seedlings, that have been introduced within these few years, and the double bearing for a late crop.

1. *White Antwerp.*

The canes of this variety are strong and vigorous ; color of the wood, a yellow brown ; leaves large and of a light green ; fruit large, of an oval form, or

much like a thimble, color dull yellow, or an amber. An excellent bearer.

The fruit of this kind is the best variety known for the dessert, but it will not preserve well in any way I am acquainted with ; it is, therefore, altogether adapted to the dessert.

2. *The Red Antwerp.*

The red Antwerp, like the white, bears its name from its place of parentage. The fruit is of an excellent quality, and particularly adapted for preserving into jams, jellies, and in some cases the fruit is mashed and made into a pleasant wine, or shrub ; it is also used in domestic cookery, with the currant or cherry, when ripe, for the purpose of making tarts, and is an excellent fruit for puddings, &c.* The Red Antwerp cannot be said to be quite equal to the White Antwerp for the dessert, although it is often used for that purpose, and makes one of the prettiest dishes of fruit of its season.

The canes or wood of this variety is strong and luxuriant, of a mixture of red or brown, with purple spines ; the leaves a dark green, a little mottled or tinged with purple when at maturity ; the fruit is nearly the same shape as the White Antwerp, although not so large ; color, a deep red ; flavor, a pleasant sub-acid and very delicious. An excellent bearer.

3. *Mason's Seedling Grape.*

This superior variety originated with Mr T. Mason, of Charlestown Vineyard. It was hybridized

* I have the testimony from a lady who has made use of the leaves of the Raspberry, that it makes a pleasant beverage, and is a good substitute for G. Tea.—E. S.

by him with the Scarlet Rockingham and Red Antwerp. The fruit and plant resemble much the Red Antwerp, but is said to be a better bearer ; and has racemes or bunches of fruit like grapes, whence its name, Grape Raspberry. The testimony of the fine specimens of this fruit, shown at different times at the Massachusetts Horticultural Rooms, is a sufficient guarantee to recommend this variety as one of the best among the Raspberry.

4. *Franconia.*

One of the best red raspberries in cultivation, and like the Red Antwerp, embraces the good qualities of a dessert fruit, and preserves admirably. It is enough to say that it was at first introduced, and generally grown by Samuel G. Perkins, Esq., Brookline, near Boston, who possesses one of the most choice collections of fruit in the Union.

DESCRIPTIVE LIST OF CURRANTS.

Of all the useful fruits cultivated, the currant bears the least consideration in the choice of the different varieties ; this I cannot account for, in any other way than the easy and simple manner in which the currant can be increased and grown, has induced those desirous to cultivate it, to select from their neighbors without any regard to the different kinds and qualities, which are so totally different as to allow more than half difference in produce, besides much in quality.

Of all the different varieties of currants, there is but one kind of the different colors of red, white,

and black, that I can recommend, which are the red Dutch, the white Dutch, and the common black currant ; it is rather singular that the superior qualities of the red and white Dutch, which have been known in horticulture over one hundred years, should not have been more generally introduced among the growers of fruit, as the genuine varieties are seldom to be met with. This must be altogether owing to the neglect of close attention to selection ; and in a fruit of such useful and domestic nature as the currant, it is greatly to be hoped that the good kinds will be selected, which are the red and white Dutch, which, if once generally introduced, will at no distant day have precedence over all others. Let the planter apply to any respectable nurseryman or fruit grower, for the red and white Dutch currant, particularly, and he will at once have the very kinds he most desires, and the very best of currants.

The White Dutch Currant.

The tree is of a weeping habit, wood short jointed, and the leaves of a light green, and hairy surface ; the fruit of an amber color or dull yellow, large round fruit, and long bunches ; the bunches grow in thick clusters from the joints ; the flavor of a pleasant acid, agreeable to the taste.

This variety is generally used as a dessert, for which it is particularly adapted—it is also used for a wine, but does not preserve well.

The Red Dutch Currant.

The tree is of a more upright habit than the latter, and may be distinguished from the common red by its branches being more extended into a hori-

zontal manner. The wood is thick jointed, the leaves of a dark green, fruit very dark red, approaching a purple when fully ripe, bunches long and growing in clusters on the old wood, berries round and large.

This variety is not so pleasant to be eaten from the hand as the white Dutch, but is more used in domestic cookery. It also makes excellent jams, jellies, and preserves of any kind, and is used by many for a domestic wine.

The Red Champaign.

The red champaign currant is not in general cultivation, although I consider it next in quality to the red Dutch. The plant is of an erect habit, luxuriant growth, and good bearer; the bunches are long but do not hang so much in clusters as the former varieties; the fruit is round, of a large size; color light red, and very transparent.

The Black Currant.

This variety is so well known that I need not describe it; the black currant should always find its way into every garden, for its useful qualities in colds, sore throat, &c., for which it is used with admirable success when made into jams and jellies; and black currant wine has been too long known in sickness, for me to record its usefulness in this place.

DESCRIPTIVE LIST OF GOOSEBERRIES.

It is very difficult to give a descriptive list of the best kinds of the gooseberry that will answer for

this climate, particularly as its culture so injuriously affected by the mildew, which sometimes entirely destroys the crop. The following kinds are those which are of hardy quality, and I hope will be found to answer a good purpose in this country.

1. Roaring Lion.

One of the best red gooseberries, of a very large size ; hairy and of a dark red color ; tree of an erect habit, and fine grower and bearer.

2. Wilmot's Red.

According to Kenrick, one of the best of the reds—who states that it is large size, very early, of an excellent flavor, and incredibly productive.

3. Early Green Hairy. (The Early Green Hairy Gooseberry, Green Gascoigne of Forsyth and Scotch Gardens.)

Pomological Magazine, No. 22.

This fruit I have known for twenty years in England, and am well satisfied of its superior qualities as an early table fruit, to be of the first order, and an abundant bearer.

It is to be regretted that it has been displaced in many collections, with the iron-monger and other small varieties of merit, by the larger kinds inferior in every degree. I know not of any gooseberry more deserving a trial of culture, than the present ; which, if it could evade the mildew, so detrimental to the gooseberry, it would be a great acquisition to the dessert. I give its character in full from the *Pomological Magazine*.

“ The branches grow very erect ; the leaves are

dark green, and slightly pubescent above. The berry is small, round, and ripens early ; the skin is hairy, deep green, and thin ; flavor rich and very sweet ; a good bearer."

4. *Iron Monger or Old Red Rough.*

An old small red variety of gooseberry, now but little known ; but it deserves to be cultivated as the best variety for preserving ever grown.

5. *Whitesmith.*

A fine large white gooseberry, and one of the best bearers in this country ; fruit large, oval, of a superior flavor and the best of the whites.

6. *Early Green Hairy.*

A small early fruit, of very sweet flavor and generally a good bearer.

7. *Crown Bob.*

A fine red fruited variety, of a drooping habit, and one of the best bearers of the English cultivators. It will probably do well here.

DESCRIPTIVE LIST OF PLUMS.

1. *Italian Damask.*

This is one of the prettiest early plums. It has a dark blue skin—nearly black ; flesh yellow ; juicy and high flavored. Ripe in August.

Like most of the early plums it cannot be recommended as a good bearer, but it deserves a place in every collection.

2. *Purple Gage.*

Fruit of a medium size, nearly round, a little flattened at the ends ; skin of a violet color, with light blue bloom ; the flesh greenish, rich and high flavored. A first rate freestone plum, a great bearer. Ripe in August. (*Manning.*)

3. *Green Gage.*

The green gage is undoubtedly one of the best plums grown in this or any other country. The tree is of a hardy habit, and flourishes well in any place where the plum grows to perfection. It is the least local fruit I am acquainted with. The fruit when green is used as a tart, for which it answers admirably ; when ripe it is used as a dessert, and is equal to any fruit of its season.

The fruit is of a medium size, with a green skin, approaching to a yellow when perfectly ripe, a little dotted with red ; flesh firm and of exquisite flavor. It should be eaten before it is too ripe, for then it in a measure loses that fine richness peculiar to it.

4. *Bleecker's Gage.*

A variety which originated with the Rev. Mr Bleecker, Albany, N. Y., where it grows to great perfection, and is esteemed one of their best plums. This is evidently a natural fruit, as it is often propagated from the sucker, particularly in the vicinity of Albany.

This plum is of an oval form, with a skin when ripe similar to the green gage, "a dark yellow, with dark red spots or blotches ; the flesh rich and excellent." A healthy, vigorous growing tree, and generally a good bearer.

5. *Duane's Purple.*

A very large purple plum, with a dark purple skin, of a rich sweet flavor ; does admirably well with Mr Pond of Cambridgeport, near Boston.

This plum is highly deserving a place in every collection.

6. *Bolmar's Washington.*

A very superior plum in size and flavor ; of an oval form, with a yellow skin, speckled a little with red. The tree is of an upright luxuriant habit, with fine dark foliage, and a uniform moderate bearer in all parts of the Northern and Middle States.

“The origin (says the *Pomological Magazine*) of this variety is remarkable. The parent tree was purchased in the market of New York, some time in the end of the last century. It remained barren for several years, till, during a violent thunder storm the whole trunk was struck to the ground and destroyed. The roots afterwards threw up a number of vigorous shoots, all of which were allowed to remain and finally produced fruit. In 1821 several trees were presented to the Horticultural Society, London, by Dr Hosack.”

7. *Blue Imperatrice.*

A late French plum of medium size, remarkable for its hanging long on the tree, for which it is in Great Britain cultivated on western walls for a late crop. When fully ripe, and a little dried in the flesh, its flavor is very fine. The skin is a dark purple, approaching to a blue black, with a bluish bloom. It should be cultivated in every collection as the best late plum and a good bearer.

8. *Damson.*

It is needless for me to describe this well known plum ; my only object in giving it a place here is to particularly recommend it to the young planter as the best preserving plum, and as deserving a place in every collection.

DESCRIPTIVE LIST OF CHERRIES.

In giving a descriptive list of cherries, I have confined it to a very few varieties, as the early, middle, and late seasons are all that seem necessary, for the cherry, although one of the most pleasant fruits of its season as a dessert, has but little claim as a fruit for long keeping or domestic purposes, except as a preserve.

1. *Early May Duke.*

The May Duke is one of the earliest and best cherries, and of long repute. The tree is of an upright, close, compact growth ; leaves of a dark green ; generally a good bearer. The fruit, when ripe, is of a dark red ; strigs long ; of an excellent flavor ; requires a warm location to bear an early crop.

2. *Harrison Heart.*

A fine early variety of heart-shaped fruit of an amber color, of a light red near the sun ; a very thriving tree, and an excellent bearer.

3. *Black Tartarian.*

One of the best and most esteemed varieties of

the heart kind; a good bearer, and a handsome thrifty growing tree. It is rather tender, and is sometimes winter killed in exposed situations.

“Fruit six lines in length, a heart shape; at maturity black and shining; the flesh black violet and marbled, fine and breaking.”—*Kenrick*.

4. *Black Heart*.

A superior variety of the heart, and an excellent bearer. It is too well known to require any further notice, than to recommend it to a place in every collection of fruit.

5. *Archduke*.

“A large, globular formed, red cherry; like the May Duke it grows in clusters; but the tree grows more vigorous than that variety. An excellent cherry; and a great bearer, ripening in July.”—*Kenrick*.

DESCRIPTIVE LIST OF PEACHES.

In the description of the following list of peaches, I am indebted to Mr Kenrick's “*Orchardist*,” and I hope the selection will answer every purpose of the fruit grower.

1. *Early Anne*.

“The trees of this variety are of feeble growth; the young wood is subject to mildew. Fruit small, white, globular; the flesh white, melting, saccharine, and good. The chief merit is its ripening early.”

2. *Early Purple.*

“One of the most beautiful of peaches ; encompassed by a middling suture ; of a globular form flattened at the base ; its height twentysix lines. Flowers large, and brighter than those of the Grosse Mignonne ; the fruit large and of a deeper red ; the flesh equally melting and fine, vinous and high flavored. August.”

3. *Early Royal George.*

“A very large, handsome, and superior fruit, of a globular form ; of a yellow color in the shade, but of a fine deep red next the sun ; the flesh melting, juicy, saccharine, vinous, and most excellent. It ripens in August, and is one of the very best of all peaches, and a most productive kind.”

4. *Early Red Rareripe of Rhodes.*

“The fruit is large, of a deep red color, which covers most of its surface ; of a globular form ; the flesh stained to the stone with red ; melting, juicy, rich, slightly acid, vinous, and excellent. An excellent fruit, and deserves to be recommended.”

5. *Red Rareripe.*

“The leaf of this tree is smooth and without serratures ; the fruit is large, its suture deep, covered with minute specs or dots of red in the shade, but of a red color next the sun. This peach is decidedly one of the very best of all peaches. It ripens soon after the nutmeg peach, and the tree is not liable to overbear. Early in August.”

6. *George the Fourth.*

The fruit is of medium size, downy ; of a globular form, swollen on one side ; pale yellow in the shade, dark red next the sun ; the flesh pale yellow, but red next the stone ; of a rich and excellent flavor. This fine fruit originated, according to Mr Floy, in the garden of Mr Gill, Broad-street, New York."

7. *Noblesse.*

"The tree is of vigorous growth, and very productive. The fruit is generally large and round, but sometimes oblong, with a very small nipple ; marbled with red and dull purple next the sun ; the flesh is white, tinged with yellow ; white at the stone ; very sweet and melting, but perhaps less vinous than some others ; it ripens well and early. The stone is short, round, and very prominent, rough."

8. *Early Newington.*

"A beautiful fruit, of medium size, and globular form ; of a white color in the shade, but red next the sun. The flesh juicy, rich, and high flavored. The stone is small. Last of July."

9. *Old Newington.*

"This fruit is large and globular ; pale yellow in the shade, but of a fine bright red next the sun, sometimes marbled with deeper red ; the flesh is yellowish white, very juicy, rich, sweet, and well flavored. An excellent fruit, ripening in September, and productive."

DESCRIPTIVE LIST OF APPLES.

1. *Early Harvest.*

The best early apple of its season, and highly deserving a more general cultivation. It is ripe the latter end of July or the beginning of August ; of a medium size ; flat form ; color bright yellow, or straw color ; flavor sprightly and pleasant acid ; ripening irregular, the earliest dropping from the tree as they change their color.

The tree is of a pendulous habit, healthy, grows to a moderate size, and bears freely. It forms a principal item in the collections of apples in its vicinity.

2. *Early Bough.*

The best early sweetening I am acquainted with, and seems to flourish tolerably well in most parts of the middle states. The fruit is large and of an oval shape, pale yellow a little tinged with red ; an admirable apple for baking ; tree a good bearer, and ripe soon after the early harvest.

3. *Red Juneating.*

There are several varieties of this early apple, and the qualities of all that I have seen much resemble each other. The trees are of an upright slender habit, of a medium stature ; the fruit of a moderate size, red, generally a little striped ; flavor pleasant ; ripens early. The juneatings are all table fruits, and are rarely used for culinary purposes. Trees free bearers.

4. *Summer Pearmain.*

The summer pearmain is too well known as a fruit of the first order, to require any recommendation or description of its good qualities, only that it deserves a place in every good collection of fruit, as an excellent summer apple. It ripens in August and September; tree an abundant bearer.

5. *Fall Harvey.*

A fine large fall and early winter apple, extensively cultivated in the state of Massachusetts, more particularly in the county of Essex, where, according to the opinion of Mr Manning, it may have originated, who says, "It is, without question, the finest fall and early winter apple;" a good bearer, and deserving extensive cultivation.

6. *Hawthorndean.*

A very handsome middle sized apple, with a rich juicy white flesh and yellow skin with red next the sun; well adapted for a fruit garden. The Hawthorndean is evidently one of the best kind of apples we have to cultivate in a close confined ground, as it bears on very small trees, and gives a good annual produce, and is one of the best apples for the market in the fall. Bears equally well in any part of the Middle States.

7. *Porter.*

"Originated on the farm of the Rev. Samuel Porter, in Sherburne, Mass."—*Manning*. This fine fruit ripens in September and October, and may be considered as a superior apple in quality, and a first rate bearer.

8. *Ribstone Pippin.*

The best table apple of its season in England, which is in December and January, but in this climate it ripens in October and November, and does not possess the rich aromatic flavor as in its native country. The tree grows with us to a moderate size, and the fruit is fine, as a fall apple ; the color of a russet yellow mingled with red nearest the sun. It should find a place in every good collection of fruit.

9. *Golden Russet.*

A pretty variety of the russet, said to have originated in Essex county, Mass. ; an abundant bearer, and a thrifty growing tree ; fruit rather under a moderate side, of a rich pleasant flavor ; an excellent bearer in Massachusetts, and probably deserving to be more cultivated in every part of the middle states.

10. *Blue Pearmain.*

This fruit is so well known that a description would be useless in this place. It is ripe in October, and keeps well through the winter months ; a free bearing tree and should find a place in every orchard in the states.

11. *Baldwin.*

This variety is said to be a native of Massachusetts, where it is raised in great quantities for winter use. The tree is of a vigorous upright growth and regular form, bearing heavy crops of fruit every alternate year.

“ The fruit is round, of a pale color in the shade, fine scarlet or crimson next the sun, sometimes red

on every side. The flesh is white, breaking, juicy, rich, saccharine, with a most agreeable acid, and excellent flavor."—*Kenrick*.

12. *Seek-no-further*.

"A large round fruit, contracted toward the summit; of a fine deep red color; the flavor sweet and excellent, relieved by a slight acid. It ripens in October, and keeps till March. The tree is a very great bearer. A Rhode Island fruit."—*Kenrick*.

DESCRIPTIVE LIST OF PEARS.

1. *Madeline*. (*Citron des Carmes*.)

A pale yellow fruit of a medium size; a little blush nearest the sun. One of the finest varieties of early pears, and generally a good bearer.

2. *Green Chissel*.

A very old early variety. Tree of a small upright habit, with thick dark leaves; fruit in clusters of a small round green form, brown next the sun; generally a good bearer.

3. *Julienne*.

A handsome growing tree, and good bearer. The fruit is of a medium size, of a smooth yellow skin, and of an excellent quality, and is said by Mr Kenrick to be "one of the most beautiful and valuable fruits of its season, and deserving an extensive cultivation. It ripens in August."

4. *Andrews.*

One of the best fall pears in the vicinity of Boston, and highly deserving a more general introduction.

“The fruit is of a large size, form inclining to an oblong, melting and of a most excellent flavor. It ripens in September.”—*Kenrick.*

5. *Williams' Bon Cretien.*

This may be said to be one of the best pears of its season cultivated in the vicinity of Boston, and will probably flourish in most parts of the states.

6. *Seckel.*

The seckel is so well known as a pear of the first order for the dessert, that any recommendation here would be superfluous ; but I must say that it should find a place in every collection of fruit in the orchard and garden. The tree thrives and bears well in most parts of the states ; produces fruit when small, and will grow in almost any situations. It requires more pruning than the pear in general owing to its growing to a thick bushy head, which has to be thinned in order that it may bear freely.

7. *Gansel's Bergamot.*

One of the finest varieties of bergamots ; bears well in the vicinity of Albany, and deserves a trial in most parts of the United States. Mr Manning observes, “It has the reputation of being a bad bearer, but in the gardens in Salem it produces good crops.” The fruit is ripe in October, and of a fine, melting, delicious flavour.

8. *Dix*.

"A fine pear; originated in the garden of Mrs Dix, in Boston. It sprung from the seed about 1812. The tree is of medium vigor, the young wood is thorny. It is very productive. The fruit large, oblong; the skin rough, thick, green, but yellow at maturity, with a blush on the side exposed to the sun; the stalk short and situated on its summit; flesh melting, juicy, rich, and of fine flavor, and is thought to be even superior to the St Germain."—*Kenrick*.

This fine pear ripens in October, and deserve a place in every collection as a first rate autumn fruit.

DESCRIPTIVE LIST OF THE QUINCE.

There are so few varieties of the quince, that it seldom occurs to the planter when purchasing to apply for any specific name or variety; he merely inquires for "*the quince*." However, like other fruit, it deserves some attention in selection. Of this I was fully convinced last year on a visit to the garden of Marshall P. Wilder, Esq., of Dorchester, by noticing a new variety loaded with beautiful fruit, growing by the side of an old kind that was almost past bearing, and the fruit which was on the tree of inferior quality. The following varieties quoted from Kenrick's Orchardist are the best I am acquainted with.

1. *Orange Quince (Maliforma or Apple Quince)*,

Is a large, roundish, beautiful fruit, ripening in November. The leaves are oval and woolly the lower side.

2. *Oblong, or Pear Quince (Oblonga).*

This fruit is pear shaped, lengthened at the base. Leaves oblong ovate.

3. *Portugal Quince (Lusitanica).*

This fruit is of a variable form, sometimes pear-shaped ; very juicy and astringent ; it is highly esteemed. London states that it is rather a shy bearer. Leaves obovate, woolly above.

DESCRIPTIVE LIST OF GRAPES.

In giving a descriptive list of grapes, I have confined it to six varieties which I hope will combine all the qualities requisite for a small collection. I have been careful to select those which are good bearers and which possess other desirable qualities.

1. *White Sweetwater.*

The white sweetwater is a hardy growing vine, and generally a good bearer in the vinery. In favorable seasons it bears very good crops of fruit in open culture. The wood is hardy, short jointed, follicles of a dark green ; inclined to a purple on the stalks ; bunches large, long, well shouldered ; the berries of a moderate size ; round ; of a greenish yellow when partly ripe ; when fully ripe, of a yellow amber ; the flower rich and juicy. The best early forcing grape on the list.

2. *Black Frontignac.*

"The bunches are rather short, and below the medium size, and loosely formed ; the berries are of a medium size, round, black, and covered with a blue bloom ; the flavor is vinous, sweet, and musky."

—*Kenrick.*

One of the best black grapes for general culture in the vinery.

3. *Black Hamburg.*

One of the best grapes known for the vinery, and more grown than any other variety. The bunches are well shouldered, the berries oval, and, when well ripened, of a very dark purple, approaching to a black color ; but when the season or management has not been favorable, the berries are red, and hence the name, often incorrectly applied, of Red Hamburg. This fine variety has been much disseminated from the famous vine at Hampton Court, (England) which is no doubt one of the originals.

4. *Frackenthal.*

A very excellent black grape, bearing some resemblance to the Black Hamburg, but longer bunches ; of an excellent flavor, and a good bearer ; cultivated to great perfection by Mr McCowan, at the Hon. J. Perkins's, Brookline, near Boston.

5. *Early White Muscadine.*

A very productive white grape, with small compact bunches, and highly deserving culture in a small vinery, when a variety is desirable.

6. *White Muscat of Alexandria.*

This is one of the most highly esteemed varieties of musk-flavored grape, and surpassed by none when well grown and ripened. It is, however, a shy bearer, and cannot be recommended for general cultivation. It requires considerable heat, and should be planted in the warmest end of the house. The bunches are long, and generally thin of berries, which are large, oval, and yellow, when well ripened.

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